

VILNIUS UNIVERSITY

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CHANGES IN UROGENITAL AND ANORECTAL FUNCTION IN PATIENTS UNDERGOING
RADICAL SURGERY FOR RECTAL CANCER

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Biomedical Sciences, Medicine (06 B)

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VILNIAUS UNIVERSITETAS

AUDRIUS DULSKAS

ŠLAPINIMOSI, SEKSUALINĖS IR ANOREKTALINĖS SISTEMŲ FUNKCINIAI POKYČIAI PO
RADIKALIAUS TIESIOSIOS ŽARNOS VĖŽIO CHIRURGINIO GYDYMO

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ABBREVIATIONS

RC – rectal cancer

TME – total mesorectal excision

FSFI – Female Sexual Function Index

IPSS – International Prostate Symptoms Score

IIEF – International Index of Erectile Function

BFLUTS – Bristol Female Lower Urinary Tract Symptoms

LARS – low anterior resection syndrome

LARS-LT – low anterior resection syndrome score-Lithuanian version

HALS – hand-assisted laparoscopic surgery

QoL – quality of life

ICC – interclass coefficient

BMI – body mass index

ASA – American society of anaesthesiologists

ARR – anterior rectal resection

PME – partial mesorectal excision

1. INTRODUCTION

Rectal cancer (RC) is a leading oncological disease in Western countries. Over 360 000 new cases were diagnosed in 2012. Every year around 180 000 patients die from the disease. In Europe it affects around 130 000 new patients a year. Mortality is around 60 000 [Chalya P.L. et al., 2013]. In Lithuania around 700 patients were diagnosed with RC in 2012 [Lithuanian cancer register, 2012]. The mortality rate is about 50%.

For years, the most important prognostic factor of rectal cancer surgery was a 5-year survival, disease free survival or rate of complications. It is known that the urogenital and anorectal function are related to the pelvic nerves and the integrity of these nerves [Mundy A.R., 1982]. Previously the damage to these nerves was an acceptable outcome of cancer surgery. With the improvement of surgical techniques and the introduction of total mesorectal excision into practice [Heald R.J., et al, 1982], patient survival significantly increased. As the survival of patients has significantly improved, additional important markers, such as quality of life, have been increasingly reported in recent years. Assuming that a patient undergoes a curative resection, rectal surgery can have a significant impact on the quality of life. The quality of life is significantly affected by anorectal and urogenital functions. Bowel dysfunction can be described as increased daily bowel movements, urgency for defecation, and a variable degree of incontinence. Continence is affected by injury to the anal sphincter. A few injury mechanisms are reported in the literature [Bryant C.L.C. et al., 2012]. Changes in the colon electrical activity (loss of rectal activity) associated with the decrease of the anal-resting pressure, lead to a significant change of the pressure gradient between the rectum and the anal canal. The result of this different pressure gradient between the neorectum and the anal canal is responsible for the postoperative soiling. After the operation, the fecal capacity of the neo-rectum is decreased, and patients lack a fecal “storage” reservoir, which leads to increased bowel movements and urgency [Kakodkar R., et al., 2006]. The damage to autonomic nerves also increases bowel motility [Lee W.Y., et al., 2008].

Urogenital dysfunction is mainly caused by direct or indirect damage to pelvic nerves. Bladder dysfunction may consist of difficulty emptying the bladder, stress incontinence, and urgency. Difficulty in bladder emptying is generally improved after 3 months, but symptoms that persist 6 months after surgery are mainly permanent [Lange M.M., et al., 2008]. Sexual function is also controlled by pelvic nerves. The damage to these nerves causes sexual dysfunction. Male sexual problems may consist of diminished erection and ejaculation, or retrograde ejaculation. Female sexual dysfunction has been reported as dyspareunia, decreased ability to achieve orgasm, and diminished vaginal lubrication and arousal. Walsh et al., were first to recognise the importance of pelvic nerve preservation during pelvic surgery [Walsh P.C. et al., 1983]. Later this technique was adopted in coloproctology. Nerve preserving TME was introduced into practice by Japanese surgeons [Hojo K., et al, 1991 and Moriya Y., et al 1994]. Although the nerve preserving technique is a gold standard for rectal cancer surgery worldwide, urogenital and anorectal dysfunction is still a major problem. According to different authors, sexual dysfunction after rectal cancer surgery is found in 10 to 35% of female patients, and up to 88% of male patients [Dulskas A., et al., 2015]. Urinary dysfunction is found in up to 10 % of all patients, and anorectal dysfunction may be as high as 87 % [Bryant C.L.C. et al., 2012].

Although identification of sympathetic pelvic nerves is quite clear, but finding parasympathetic nerves may be difficult.

With the improvement in diagnostics and treatment of rectal cancer, other quality results such as anorectal and urogenital function are becoming important. At the moment, diagnostics and treatment of patients with anorectal or urogenital dysfunction is not standardized in Lithuania. It is very important to have standardized diagnostic and treatment modalities.

1.1 Aim of the study

The goal of our study was to measure urogenital and anorectal dysfunction in patients undergoing radical rectal cancer surgery and to validate optimal means of evaluation.

1.2 Objectives of the study

1. To assess urinary function in patients undergoing radical rectal cancer surgery using validated questionnaires: the International Prostate Symptoms Score (IPSS) tool for males and the Bristol Female Lower Urinary Tract Symptoms (BFLUTS) for females.
2. To assess sexual function in patients undergoing radical rectal cancer surgery using validated questionnaires: the Female Sexual Function Index (FSFI) for females and the International Index of Erectile Function (IIEF) for males.
3. To assess anorectal function in patients undergoing radical rectal cancer surgery using the very popular worldwide *Wexner* score and the low anterior resection syndrome (LARS) scale questionnaire (adapted and validated it to the Lithuanian language), and anorectal manometry.
4. To assess early bowel functional changes in patients undergoing laparoscopic bowel resection for cancer.

1.3 Statements to be defended

1. Patients undergoing radical rectal resection for cancer have significantly deteriorated sexual, urinary, and anorectal function.
2. Our newly validated scale is appropriate for assessing anorectal function. Anorectal manometry is only optional.
3. Coffee consumption increases bowel activity after colorectal surgery.

1.4 Scientific novelty of the study

Previously in Lithuania, only one similar study was performed. The authors assessed the quality of life in patients undergoing rectal cancer surgery. Only the anorectal function was evaluated in this study (Rudinskaite G., et al., 2004).

We have introduced the newly developed low anterior resection syndrome score into our practise, which is validated in only a few countries (Sweden, Denmark, Spain, Germany and China).

Having the largest base of laparoscopic colorectal surgeries for cancer in Lithuania, we have assessed bowel function: time to passing gas and first bowel movement.

We also suggest a cheap and original way (consumption of coffee) for decreasing postoperative ileus after laparoscopic colorectal surgery for cancer.

2. MATERIALS AND METHODS OF THE STUDY

We enrolled the patients with colorectal cancer who were treated at the National Cancer Institute from 2006 to 2014. Before the study, the approval from Regional Biomedical Research Ethics Committee was granted (No 158200-02-146-41).

For better research of the different function of pelvic organs, we divided all the patients into three groups.

2.1 Groups of the patients

1. Urogenital function was assessed in patients who underwent radical rectal surgery for cancer.
2. Anorectal function was assessed in patients who underwent radical rectal surgery for cancer.
3. Bowel function was assessed in patients who underwent radical laparoscopic colorectal surgery for cancer.

2.1.1 Assessment of the patients undergoing radical rectal surgery for cancer urogenital function

Written informed consent was obtained from all patients who participated in the study at the time of their initial visit so that their clinical data could be used for any clinical study so long as their privacy is not jeopardized.

From January 1st, 2008 to December 31st, 2014, 150 patients treated for rectal cancer were enrolled. Preoperatively they filled out the urogenital function assessing questionnaires. Six-month postoperatively, the same tools were used again, 54 of them (36 male and 18 female patients) were analysed. Exclusion criteria were the following: laparoscopic rectal resection, M+ disease, and patients with dementia.

2.1.2 Assessment of patients undergoing radical rectal surgery for cancer anorectal function

From January 1st, 2008 to December 31st, 2012, 231 patients underwent low anterior resection with TME at the National Cancer Institute. An ileostomy takedown was performed on an average of 3 months following primary surgery. Patients were given questionnaires at least 6 months after the ileostomy takedown, from August to November, 2013. Of the 231 potentially eligible patients, 48 died prior to the beginning of this study. Thus, questionnaires were sent to 183 patients. One hundred and eleven (60.7 %) of them, 69 males and 39 females (mean age 66.9 years), responded. Three patients failed to complete the questionnaire. One hundred and eight (59.0 %) fully completed questionnaires were the object of our final analysis. The validity rate was 97.3 % (108 of 111).

2.1.3 Assessment of patients' undergoing laparoscopic colorectal surgery for cancer bowel function

This study is a retrospective analysis of prospectively collected data in a single tertiary care institution. A data-base was used to identify all patients who underwent HALS for colorectal cancer at the National Cancer Institute from April 2006, when HALS was started, to November 2014. All consenting patients aged 18 years or older with histologically confirmed invasive cancer of colon and rectum were included in this study. There was a single exclusion criterion—carcinoma in situ. The following variables were included into the final HALS database: age, sex, body mass index, comorbidities, cancer location and stage, prior abdominal surgery, the operation performed, operative time, intraoperative complication, estimated blood loss, conversion, time of return of

gastrointestinal function, length of hospital stay, postoperative complications, disease recurrence, and patient survival. Postoperative *gastrointestinal function* recovery was defined as the number of days to pass gases and stool (per rectum or via ostomy in the case of diverting ileostomy or colostomy) and the number of days to a tolerance of soft diet. *Conversion* to an open procedure was defined as lengthening of the hand-port incision more than what was originally planned in order to perform the procedure. *Length of hospital stay* was defined as the number of nights the patient spent from the day of surgery.

For coffee action on bowel function, an after-surgery assessment prospective study was performed at the National Cancer Institute. During the study period of January 2013 through December 2014, 105 patients were included. Patients >18 years of age who were scheduled for elective laparoscopic left-sided colonic resection for malignant diseases were eligible for inclusion in the study. Left-sided colorectal cancer was defined as that distal to and including the splenic flexure of the colon. Written informed consent was obtained. Patients were excluded if a stoma was required or a multivisceral resection was planned; if a hypersensitivity or distaste for coffee was known; if a lack of compliance was expected; or if an impaired mental state was known.

The primary objective of this study was to investigate whether coffee (with or without caffeine) intake reduces the duration of POI after an elective laparoscopic left-sided colectomy. The primary end point was the time to the first postoperative bowel movement (time from the end of surgery until the first passage of stool recorded by the patient). Secondary end points were time to tolerance of solid food (no vomiting) and time to first flatus. The time to first postoperative bowel movement, tolerance of solid food, and first flatus were recorded by a nurse blinded to the intervention during the hours after the end of the operation.

The patients were randomly allocated into groups 1 through 3. Group 1 patients had to drink 3 cups of coffee with caffeine daily (100 mL at 8:00 am, 12:00 pm, and 4:00 pm), beginning on the morning after surgery. In group 2, coffee was without caffeine. And in control group 3, coffee was replaced by water, at the same schedule and amount as in group 1. Patients who were randomly assigned to the water group were

not allowed to drink coffee until the first bowel movement had occurred. The patients were asked to drink the entire volume within 10 minutes under the supervision of a nurse, who was not blinded to the intervention. Patients were free to drink any amount of tap water but no more coffee or black tea. No other restrictions on food consumption or smoking were imposed. Coffee was prepared with a conventional coffee machine using the same brand and 2 types of coffee capsules (Lavazza Qualita Oro and Lavazza Caffè Decaffeinato, 8 g coffee per capsule).

After enrolment, the same evidence-based protocol of perioperative management was applied to all of the patients, following the principles of fast-track surgery. In brief, patients underwent mechanical bowel preparation with enemas, including 2 on the night before the operation and 2 in the morning just before the operation. All of the patients received a single dose of antibiotic prophylaxis consisting of 0.5 g of metronidazole and 1.0 g of cefazolin at the time of anaesthesia induction. Low-molecular-weight heparin was administered and venous compression stockings were used, starting the night before surgery. For pain control, patients received 50 mg of pethidine 2 times per day for 3 days; later, nonsteroidal analgesics (ketolgan or paracetamol) were administered. All of the operations were performed using hand-assisted laparoscopy. A circular stapler was used to achieve end-to-end colorectal anastomosis. The post-operative feeding regimen was standardized. In summary, water was offered the day after surgery, liquid food from the second day after surgery, and solid food from the third day. The postoperative feeding regimen was determined by the patient's ability and willingness to consume food and was not dependent on intestinal function, such as the passage of flatus or bowel movements. In the event of postoperative nausea and vomiting, patients received parenteral fluids and metoclopramide (10 mg in 2-mL injection solution). The postoperative mobilization schedule was standardized and was the same for the 3 study groups. The criteria for hospital discharge included stable vital signs with no febrile morbidity for ≥ 24 hours, passage of stool, toleration of a regular diet, and the absence of other complications.

2.2 Surgery for rectal cancer

2.2.1 Open surgery

Preoperative diagnosis was proven by using rigid sigmoidoscopy with biopsies, digital examination, and pelvic magnetic nuclear resonance tomography. All patients underwent a 'standard' low anterior rectal resection with total mesorectal excision. Briefly, surgery was performed under general anaesthesia. The sigmoid colon and rectum was removed with high ligation of the inferior mesenteric artery. Autonomic nerves were preserved. The descending colon was anastomosed side-to-end or using j-pouch to the anal canal by using the double-stapling technique (CEEA stapling device [Ethicon, Cincinnati, OH, USA] with an outer diameter of 29 mm or 31 mm). A diverting loop ileostomy was routinely performed at a site that had been marked previously by the stoma nurse.

2.2.2 Laparoscopic surgery (Hand-assisted laparoscopic surgery)

HALS was performed using a standardized technique [Samalavicius N.E, et al., 2013]. Briefly, a 6-6.5 cm infraumbilical, left paraumbilical or transumbilical incision is performed for the Dextrus Endopath (Ethicon Endo-surgery, LLC, Puerto Rico 00969, USA) hand-port device insertion. 3 or 2 trocars are then inserted in a standardized manner. Mobilization begins with the sigmoid and descending colon moving upwards to splenic flexure and left side of transverse colon, using a hand and harmonic scalpel. Then inferior mesenteric artery is mobilized and ligated using titanix 10 mm clips 1-2 cm from the aorta, and continuing mobilization of the inferior mesenteric vein and ligating it with same clips at the level of ligament of Treitz. The specimen is divided either at the level of promontorium (for left hemicolectomy and sigmoid resection), or mobilizing the upper part of the rectum and dividing it 5 cm below the lower edge of the rectal tumour (partial TME for upper third rectal cancer) with endoscopic linear stapler (60 mm). The specimen is removed through the hand-port incision, and further anastomosis is performed laparoscopically using a double stapling technique, making a water-air leak test, and examining the rings from the stapler for integrity. Drains were not routinely used. Fascia is closed at the level of 12 mm trocar with single interrupted

suture, and hand port - with running PDS 0 suture. Skin incisions are closed with interrupted sutures.

2.3 Questionnaires

2.3.1 Urogenital function assessment

Urinary function was assessed using validated questionnaires:

- For male patients, the urinary function was assessed using the International Prostate Symptom Scale Index.
- For female patients, the Bristol female lower urinary tract symptom score was used.

Sexual function was also assessed using validated questionnaires:

- For male patients, the International Erectile Dysfunction Score was used.
- And for female patients, the Index of Female Sexual Function.

2.3.2 Assessment of anorectal function (low anterior resection syndrome)

The LARS-LT questionnaire was developed by translating the questions into Lithuanian, a task performed by two independent translators, native Lithuanian speakers with a high level of fluency in English. The translation team compared the versions of the translations and discussed the differences. The differences were insignificant. After the two versions of the translation were compared, discussed, and adjusted, a preliminary Lithuanian version was agreed upon. It was followed by a backward translation of the preliminary Lithuanian version into English by two independent professional translators both fluent in Lithuanian and with English as their mother tongue, both of them being unfamiliar with the background objectives of the study. Both versions of the backward translation were compared with each other, and after minor adjustments, a final English version was agreed upon. There were no unresolved differences between the translations. The Lithuanian questionnaire was then administered to 20 patients to verify the adequacy and degree of comprehension of the questions (pilot study).

Clinical and demographic data of the patients are given in Table 1: Eighty (74.1 %) of the patients had cancer in the middle third and 28 patients (25.9 %) in the lower third of the rectum. Fifty-three patients (49.1 %) underwent neoadjuvant radiotherapy.

Table 1. Clinical and demographic characteristics of 108 patients

Variables	Absolute number	Percent
Male	69	63.89
Female	39	36.11
Age (years), mean (SD)	66.93 (9.57)	na
Stage, TNM		
I	30	27.78
II	37	34.26
III	41	37.96
Tumour localization		
Lower third	28	25.93
Middle third	80	74.07
Neoadjuvant radiotherapy	53	49.07
LARS score, mean (SD)	28.23 (11.03)	na
Wexner score, mean (SD)	7.66 (5.50)	na
Time after operation (months), mean (SD)	35.2 (15.21; 7 to 65)	na

SD = standard deviation; LARS = Low Anterior Resection Syndrome

To test the convergent validity of the LARS-LT, the LARS score was compared with the question from the *Wexner* scale regarding lifestyle alterations. The question was modified so that it did not just include symptoms of incontinence, and LARS symptoms were explained to the patient as well. The five frequency options range from 'never' (score 0) through to 'always' (meaning at least once per day; score 4). The patients received both as mail questionnaires. Lifestyle alterations were classified into

five categories depending on the frequency of lifestyle changes due to LARS symptoms. Mean LARS scores for each of the lifestyle alteration stages were calculated using Pitman’s test of difference in variance. Also we grouped patients into three groups: no impact (0 points for the additional question), minor impact (1 or 2 points), or some/major impact (3 and 4 points) of bowel function on lifestyle based on the response to the single lifestyle alteration question. Then, we investigated the fit between the lifestyle alteration group and LARS score. The fit between these two measures was considered perfect when patients reported no LARS and no impact on lifestyle, or minor LARS and minor impact on lifestyle, or major LARS and some/major impact on lifestyle; moderate fit, difference in one category, for instance no LARS but minor impact on lifestyle; and no fit difference in two categories.

2.3.3 Other evaluations

2.3.3.1 Anorectal manometry for anorectal function assessment

We used anorectal manometry to fully assesses anorectal function (not only using questionnaires). This prospective study was performed between September 2014 and August 2015 at the National Cancer Institute. Thirty patients with a histologically proven adenocarcinoma of the middle or the lower third of rectum were included in the study. Two patients who underwent abdominoperineal resection, and 5 patients who had preoperative short course radiotherapy were not further evaluated. Three were lost during follow-up. Of the remaining 20, 12 were males and 8 were females; their mean age was 61 ± 8.3 years. None of them had disseminated disease on preoperative work-up or exploratory laparotomy or a history of preoperative incontinence. We excluded patients who needed (neo)adjuvant radiotherapy to reduce both the number of variables and the bias in the data (Table 2). Patients underwent standard rectal resection with TME.

Table 2. Clinical and demographic characteristics of 20 patients who underwent low anterior resection

Variables	Absolute number	Percent
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Male	12	60.0
Female	8	40.0
Age (years), mean (SD)	61 (2.3)	na
Stage, TNM		
I	7	35.0
II	10	50.0
III	3	15.0
Tumour localization		
Lower third	8	40.0
Middle third	12	60.0
Wexner score, mean (SD)	3.4 (2.5)	na

SD = standard deviation;

The patient was asked to miss one meal prior to the study and to evacuate his or her rectum at least 2 hours before the measurement was taken. The patient was placed in the left lateral position; then, a perianal inspection and a digital rectal examination were performed, after which the patients was given instructions concerning the anorectal manometry examination. We used a Memphis Biomedica 8-channel water-perfused flexible catheter (Medicalpuls, Bologna, Italy) with side-holes for pressure recording, and the procedure was performed using a station pull-through technique. A computerized system (Polygram Lower GI, Synectics Medical, Stockholm, Sweden) was used for data acquisition. After calibration and exclusion of air from the system, the transducer was placed in the rectum and withdrawn at a rate of 5 mm/sec. The recording was started after a 5-minute period of stabilization. First, the mean basal pressure was recorded; then, the patient was asked to voluntarily squeeze his or her perianal muscles as hard as possible and to retain the contraction for as long as possible. The maximum squeeze pressure and the duration of maximum squeeze were, thus, recorded. A standard balloon-tipped catheter with transducer was then placed with the balloon 8 cm from the anus. The perception of rectal filling and the capacity of the neorectum were measured by placing the balloon with its lower edge 5 cm above the anal verge and subsequently slowly, in a stepwise manner, inflating the balloon

with air in 20-mL increments. The thresholds of the patient's first perception of rectal filling, urge to defecate, and maximal tolerable volume were assessed.

2.4 Statistical analysis

Continuous variables are expressed as median (range). The data collected were analysed using software (SPSS, SPSS Inc, Chicago, IL). $P < 0.05$ was considered statistically significant.

Testing the discriminant validity of newly developed LARS-LT score, we primarily hypothesized that the LARS score would differentiate between the bowel functions of patients with different demographic or clinical features such as sex, age, distance of the tumour from the anal verge, radiation therapy, and length of postoperative period. Those numeric variables were changed into binary variables: <66.5 years or ≥ 66.5 years (the median age serving as the cut-off point); <10.0 cm or ≥ 10.0 cm (the median distance of the tumour from the anal verge serving as the cut-off point); and <12 month and ≥ 12 months (the median length of postoperative period serving as the cut-off point).

Internal consistency and reproducibility were investigated to evaluate the reliability of the instrument. Internal consistency examines the complementary nature of items by searching for contradictions and measurement errors. To evaluate internal consistency, Cronbach's alpha coefficient was calculated for the generic score and all five domains. A high positive value for Cronbach's alpha (>0.70) suggests that the LARS score measures consistently.

To evaluate reproducibility, a test-retest study was performed by comparing LARS scores obtained at the time of the patient's first visit with those obtained on the second visit (in an interval of 7–14 days). Traditionally, it is accepted that the intraclass correlation is adequate when the value is higher than 0.80. Patients were asked if they had experienced any significant change in bowel function between the first and the second test. Those confirming a change in bowel function were excluded from the test-retest analysis. Non-responders were contacted once more, either by mail or by phone.

A sample size determination for the coffee study was performed after a power analysis (power = 0.8; β = 0.2; α = 0.02) using sample size software (PASS 2005, NCSS LLC, Kaysville, UT). SD and a mean time to first bowel movement were taken from previous studies.^{5,17,18} These data was used for the sample size equation: $n = 2[(Z\beta + Z\alpha) \sigma / \delta]^2$, where n (sample size in each group) = 30; α = 0.05; $Z\alpha$ = 1.96; β = 0.2; $Z\beta$ = 0.84; σ (estimated SD based on similar studies) = 1.4; and δ = the estimated effect size (i.e., the minimal difference desired between the 2 study interventions or the clinical outcomes of the 2 groups) – 1.

Considering a possible 10% dropout, 35 patients were considered as the sample size for each study arm, and consequently a total number of 105 patients were selected and entered into the study after matching the inclusion and exclusion criteria.

3. RESULTS

3.1 Urogenital function changes in patients undergoing rectal surgery for cancer

All the clinical and demographic patients data presented in Table 3.

Table 3. Patients' clinical and demographic data.

Variable	Patients (N=54)
Age (years) (mean±SD)	60.04±12,9 (34-80)
Female	60.1±12.04 (34-80)
Male	60.0±12.03 (36-79)
Distance from the anal verge	
Upper rectum	12 (22%)
Middle rectum	24 (45%)
Lower rectum	18 (33%)

Type of operation	
LAR with partial TME	7 (13%)
LAR with TME	36 (66.6%)
APR	11 (20.4%)
pT stage	
T1	9 (16.6%)
T2	15 (27.8%)
T3	30 (55.6%)
pN stage	
N0	23 (42.6%)
N1	18 (33.3%)
N2	13 (24.1%)
Radiotherapy (pre/post)	25/20 (83.3%)
Temporary loop ileostomy	39 (72.4%)
Postoperative complications	6 (11.1%)

Bladder function

Female and male function postoperatively was worse comparing with the baseline: 12 (75 %) preoperatively vs. 14 (78 %) postoperatively in females and 29 (80.1%) vs. 32 (88.9%) accordingly in males. The seven items and mean scores of the IPSS from baseline to 6 months after surgery are shown in Table 4. The mean IPSS score before and after surgery was elevated, but there was no significant difference. The score of each of the seven items such as incomplete emptying, frequency, intermittency, urgency, weak stream, straining, and nocturia did not show any significant changes after surgery.

Table 4. Male urinary dysfunction according to IPSS before and after the surgery

Variable	Baseline	6 month
Emptying	1.2±1.8	1.9±1.8
Frequency	1.3±1.5	1.6±1.7
Intermittency	1.1±1.5	1.4±1.6
Urgency	0.9±1.6	0.6±0.9
Weak stream	1.7±1.6	2.0±1.9
Hesitancy	0.4±0.9	0.8±1.4
Nocturia	2.2±1.6	2.2±1.6
Total	8.6±6.9	10.1±7.6

Figures are mean ± standard deviation.

* $P > 0.05$

Sexual function

The average of IIEF domain scores was significantly decreased after surgery. Erectile function was decreased from 14.4 ± 10.8 to 9.14 ± 9.9 ($p < 0.05$). Erectile dysfunction was seen in 15 (41.7 %) of patients at the baseline and 23 (63.9 %) postoperatively. Of these, 13 (36 %) were impotent preoperatively and 21 (58.3 %) postoperatively. Intercourse satisfaction and orgasmic function were decreased from 6.9 ± 5.0 to 5.3 ± 5.0 and from 4.6 ± 4.1 to 4.0 ± 4.2 , respectively ($p < 0.05$ and $p > 0.05$). Sexual desire and overall satisfaction were decreased from 5.4 ± 2.5 to 4.7 ± 2.4 and from 5.8 ± 2.7 to 4.5 ± 2.5 , respectively ($p > 0.05$ and $p < 0.05$; Table 5). Total mean FSFI score (N = 18) was 8.2 ± 5.8 (preoperatively) vs. 6.7 ± 8.3 (postoperatively; $p < 0.05$). The score of each of the six items such as desire, arousal, lubrication, satisfaction, orgasm, and pain did not show any significant changes after surgery (Table 6).

Postoperatively, six patients (75 %) had sexual dysfunction, of them impotence—62.5%. Three female patients underwent APR. Only two of them have filled the questionnaires. Both had sexual dysfunction preoperatively.

Table 5. Changes in International Index of Erectile Function (IIEF) domain score before and after surgery

Domain of sexual function	Preoperatively	Postoperatively	Worsening
Erectile function*	14.4±10.8 Erectile dysfunction 15 (41.7%) Impotence 13 (36%)	9.14±9.9 Erectile dysfunction 23 (63.9%) Impotence 21 (58.3%)	10 (27.8%)
Intercourse satisfaction*	6.9±5.0	5.3±5.0	9 (25.0%)
Orgasm	4.6±4.1	4.0±4.2	4 (11.0%)
Sexual desire	5.4±2.5	4.7±2.4	3 (8.3%)
Overall satisfaction*	5.8±2.7	4.5±2.5	9 (25.0%)

P < 0.05

Table 6. Changes in Female Sexual Function Index (FSFI) domain score before and after surgery

Domain of sexual function	Preoperatively	Postoperatively	Worsening
Desire	2.1±1.8	2.06±1.5	2 (11.1%)
Arousal	1.4±1.9	1.2±1.8	3(16.7%)
Lubrication	0.9±1.6	0.9±1.5	0
Satisfaction	1.9±1.8	1.2±1.3	4(22.2%)
Orgasm	1±1.8	0.9±1.6	1(5.56%)
Pain	0.6±1.2	0.6±1.1	0
Full scale score	8.2±9.6	6.7±8.3	2 (11.1%)

3.2 Anorectal function changes in patients undergoing rectal surgery for cancer (low anterior resection syndrome)

Of the 108 patients' questionnaires analysed, twenty-seven patients (25 %) had no LARS, 26 (24 %) had minor LARS, and 55 (56 %) had major LARS.

Validity

According to Pitman's test of difference in variance, the LARS scale showed positive correlation with the QoL question: $r = 0.42$, $n = 108$, $p = 0.01$. The proportion [95 % confidence interval (CI)] of patients with a perfect fit between QoL category and LARS score category was 54.5 % (49.7 %; 59.1 %); a moderate fit was found in 38 % (34.5 %; 43.7 %); and no fit in 7.5 % (5.5 %; 9.3 %) (Table 7). Differences in the LARS score between QoL categories were significant ($p < 0.05$). Age, sex, neoadjuvant

radiotherapy, and tumour localization did not have an impact on severity of bowel dysfunction symptoms after low anterior resection with TME.

Table 7. Fit between low anterior resection syndrome (LARS) scale category and quality of life (QoL) category.

LARS score group	No impact on QoL	Minor impact on QoL	Some/Major impact on QoL
No LARS	11 (10.1%)	10 (9.3%)	6 (5.6%)
Minor LARS	5 (4.6%)	13 (12%)	8 (7.4%)
Major LARS	2 (1.9%)	18 (16.7%)	35 (32.4%)

Perfect fit: 54.5%, **Moderate fit:** 38%, **No fit:** 7.5%

The LARS score could not detect differences between female and male patient groups ($p = 0.33$), patients' age (0.45), patients who had/had not undergone radiation therapy ($p = 0.07$), and those in whom the distal edge of the tumour was close to or far from the anal verge ($p = 0.17$). However, there was a significant difference between patients who filled out the questionnaire less than 12 months and more than 12 months after the operation ($p = 0.02$).

Test–retest reliability

The internal consistency of the LARS-LT in the 108 patients, evaluated using Cronbach's alpha, was found to be 0.85 for flatus control (Question (Q) 1), 0.73 for liquid stool control (Q2), 0.93 for frequency of bowel openings (Q3), 0.98 for incomplete bowel emptying (Q4), 0.89 for urgent rush to the toilet (Q5), and 0.88 for the generic score (Table 8). These results indicate that the LARS-LT measures consistently for the generic score and across all domains.

Table 8. Descriptive statistics and reliability (Cronbach's alpha and ICC)

Domain	Score at baseline (SD)	Score at second visit (SD)	Cronbach's alpha at baseline	Cronbach's alpha at second visit	Interclass correlation coefficient
Q1	3.55 (2.68)	3.75 (2.55)	0.85	0.84	0.82
Q2	1.65 (1.53)	1.50 (1.54)	0.73	0.72	0.71

Q3	2.45 (2.01)	2.55 (2.04)	0.93	0.93	0.91
Q4	5.25 (4.92)	5.35 (5.02)	0.98	0.97	0.98
Q5	6.80 (6.53)	7.35 (6.39)	0.89	0.88	0.86
Overall	19.85(9.78)	20.50(9.66)	0,88	0,87	0.92

In the test–retest study, data were available for 20 patients on the second visit. The mean interval between the first and second visits was 14 days (range 9–18 days).

Interclass correlation coefficients for the 20 patients are given in Table 8. There was a good correlation between LARS-LT scores obtained on the first and second visits for the generic score and across all domains (p value = 0.9).

3.2.1 Anorectal manometry for patients undergoing rectal surgery for cancer

The difference for sphincter action was not significant, but for the rectal capacity changes were significant. Postoperatively, balloon manometry revealed an overall reduction in rectal capacity and compliance. Although the values tended to recover steadily, they did not reach the preoperative level for 4 months. First-perception volume was reduced and continued for 4 months. Urgent volume was remarkably reduced regardless ($p < 0.05$), and continued 4 months. Maximal tolerable volume also showed obvious reduction postoperatively ($p < 0.05$), and continued for 4 months. Rectoanal inhibitory reflex was absent throughout the study period in all the patients.

Wexner continence scoring showed a preoperative median score of 3.4 (range: 0 to 6, $n = 20$) and a postoperative median score of 6.3 (range: 2 to 8, $n = 20$).

Postoperatively, 14 (70%) patients complained of some degree of soiling (incontinence to liquid stool) and six (30%) with urgency for defecation. Four months after surgery, there was improvement of these symptoms: only 2 patients complaining of these symptoms. Postoperative defecation (either solid or liquid) was well-controlled. The

median number of postoperative bowel movements was three per day (range: one to seven per day).

The 95 % limits of agreement in our study were from -13.723 to 29.274, the mean difference was 7.776 (CI 5.725 to 9.826). A comparison between the *Wexner* score and anorectal manometry for bowel dysfunction after LAR for rectal cancer, showed that both methods cannot be used interchangeably because the observed differences within limits of agreement are clinically important.

3.3 Anorectal function changes in patients undergoing laparoscopic colorectal surgery for cancer

Over a study period, 255 HALS colorectal resections were performed. Overall, the patients' average age was 63 ± 11.2 years (from 26 to 89 years). There were 137 male and 118 female patients. Body mass index (BMI) was 25.9 ± 6.2 kg/m². In all, 154 patients (60.4 %) had comorbidities: 128 of them (83.1 %), cardiac; 14, pulmonary; 19, diabetes; 6, renal; and 13 patients had other various comorbidities. However, the majority of patients (75 %) were designated as ASA class 1 or 2. In total, 53 patients (20.1 %) had experienced a prior abdominal surgery.

All patients had invasive colorectal cancer. Diagnoses included, in descending order, sigmoid colon cancer for 122 patients (47.8 %), upper rectal cancer for 102 patients (40 %), descending colon cancer for 19 patients (7.5 %), middle rectal cancer for 7 patients (2.7 %), and colon splenic flexure cancer for 3 patients (1.2 %), and 2 patients had sigmoid cancer and multiple polyps (0.8 %). Stage I cancer was confirmed for 91 patients (35.7 %), stage II for 71 (27.8 %), stage III for 75 (29.4 %), and stage IV for 18 (7.1 %).

The procedures performed are shown in Table 9. Two subtotal colectomies with ileorectal anastomosis were performed due to sigmoid cancer and familial adenomatous polyposis, and another two subtotal colectomies were performed due to descending colon cancer and multiple polyps in the transverse and right colon. Two patients underwent HALS sigmoid colectomy, 9 and 10 days after laparoscopic sigmoid colotomy and polypectomy for large sigmoid adenomas with high-grade dysplasia. Later

in surgical specimen pathohistology turned out to be T1 sigmoid colon cancer. None of these patients had residual or lymph-node disease in the final pathology.

Table 9. HALS procedures performed in 255 patients

HALS procedure	Number	Percent (%)
Anterior rectal resection with partial mesorectal excision	102	40
Left hemicolectomy	64	25.1
Sigmoid colectomy	73	28.6
Anterior rectal resections with total mesorectal excision	7	2.7
Subtotal colectomy	6	2.4
Transverse colon resection	3	1.2

It is noteworthy to mention that the mean HALS time was 105 min (55–270) and the mean blood loss was 100 ± 35.0 ml. There was one episode of significant intraoperative bleeding from mesenteric vessels due to an inoperative suturing device. There was a positive air-leak test in two patients (0.78 %), and interrupted 3/0 vicryl sutures were additionally used to secure the anastomosis. Conversion rate was 1.96 % (5/255). The average number of lymph nodes harvested was 15, with the minimum number being 2 and the maximum being 54.

Functional outcomes are shown in Table 10.

Table 10. Functional outcomes of patients undergoing HALS for colorectal cancer

Gastrointestinal function	Duration, (days)
First flatus	1.92 (1.5–4.5)
Tolerance of solid food	2.85 (1.4–3.4)
First bowel movements	3.64 (2.6–4.3)

The median length of hospital stay was 6.8 days (3–31). Post-operative complication rate was 9.8 % (25 patients). In all, 3 patients (1.17 %) demanded

explorative laparotomy. Postoperative mortality rate was 0.45 % (one death). A 78-year-old man who underwent partial mesorectal excision for stage III upper rectal cancer died because of septic pneumonia on the seventh postoperative day.

Postoperative complication following HALS and its consequences are shown in Table 11.

Table 11. Primary HALS and postoperative complication

Primary operation	Complication	Patients	Rate (%)	Management	Outcome
Anterior rectal resection* with PME**	Anastomotic leak	1	0.39	Laparotomy, washout, loop ileostomy	Recovered
Left hemicolectomy	Paracolic abscess ***	1	0.39	Laparotomy, washout, loop ileostomy	Recovered
Left hemicolectomy	Pneumonia	1	0.39	Conservative	Recovered
ARR with PME	Intraabdominal abscess	1	0.39	Draining	Recovered
Left hemicolectomy		1	0.39	Conservative	Recovered
ARR with PME	Urinary retention	3	1.35	Suprapubic catheter	Recovered
ARR with PME	Dysuria	3	1.17	Conservative	Recovered
ARR with PME	Bleeding from the anastomotic line	1	0.39	Conservative	Recovered
Subtotal colectomy	Stroke	1	0.39	Conservative	Recovered
ARR with PME	Myocardial infarction	1	0.39	Conservative	Recovered
Left hemicolectomy	Subacute intestinal obstruction	3	1.17	Conservative	Recovered
ARR with PME	Wound sepsis	1	0.39	Conservative	Recovered
Sigmoid resection		2	0.78	Conservative	Recovered
Resection of transverse colon	Intraabdominal abscess	1	0.39	Draining	Recovered
Left hemicolectomy	Hemoperitoneum	1	0.39	Laparotomy, coagulation	Recovered

ARR with PME: conversion to open	Septic pneumonia	1	0.39	Conservative	Died
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*Anterior rectal resection – ARR.

**PME – partial mesorectal excision.
anastomotic line.

***Due to perforation above the

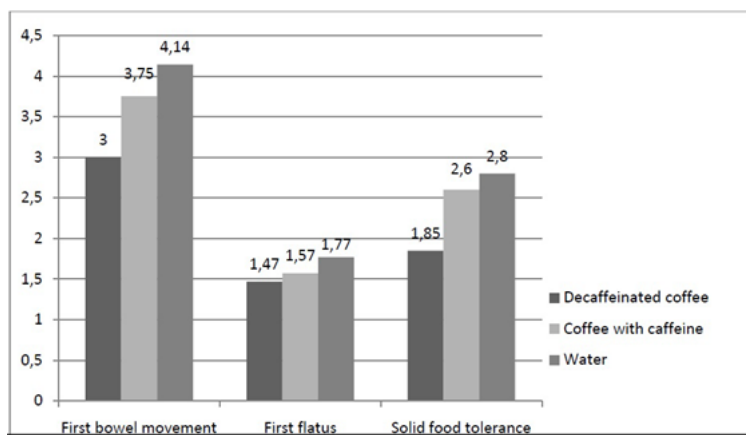
In all, 8 (3.1 %) patients had postoperative hernias. There was 4.3 % of local recurrence (3.2 % in the colon and 5.8 % in the rectum) and no port site metastasis during 36.3 (1–108) months of surveillance. The 3-year survival rates were 100 % for stage I, 97 % for stage II, 84 % for stage III, and 50 % for stage IV.

3.3.1 Coffee effect to bowel function in patients undergoing laparoscopic colorectal surgery for cancer

A total of 105 patients were randomly assigned, 35 to each group. Fifteen patients were excluded: 4 did not meet the inclusion criteria, 5 had a change in surgical procedure, and 6 refused to participate (or did not drink all of the amount of coffee or water).

We compared the time, measured in days, among the 3 groups. The time until the first bowel movement was significantly ($p < 0.05$) shorter in the decaffeinated coffee group (3.00 ± 1.50) versus coffee with caffeine (3.75 ± 1.53) versus the water group (4.14 ± 1.15). The time until the tolerance of solid food was significantly shorter in the decaffeinated group versus coffee with caffeine and the water group (1.85 versus 2.60 and 2.80; $p < 0.05$). Time until the first flatus (1.47 versus 1.57 and 1.77 for decaffeinated coffee versus coffee with caffeine and water; $p > 0.05$) did not show a significant difference (Fig. 1).

Figure 1. Postoperative days for selected criteria, $p < 0.05$



Postoperative hospital stay was similar in all 3 of the groups: 7.0 days in the water group, 6.6 in the decaffeinated coffee group, and 6.0 in the coffee group ($p = 0.166$). The percentage of nasogastric tube insertion was low in all 3 of the groups (Table 1). There were no readmissions in our study.

4. CONCLUSIONS

1. Urinary dysfunction was found in 8.3% of male and 11.1% of female patients undergoing radical rectal cancer surgery.
2. Sexual dysfunction was found in 27.8 % of male and 11.1% of female patients undergoing radical rectal cancer surgery.
3. We have validated a new Low anterior resection syndrome score for use in Lithuania. This scale was found to be more precise in diagnosing anorectal dysfunction after rectal surgery. Anorectal manometry is only an optional examination.
4. We also have found that the patients consuming coffee in early postoperative period, passed stool earlier.

5. PRACTICAL RECOMMENDATIONS

1. LARS is a major problem in patients undergoing rectal cancer surgery. This results in significantly worsening the patient's quality of life. All the patients should undergo surveillance of anorectal function on every visit. When abnormalities are found – seek consultation with a specialist.
2. LARS treatment is not standardized at the moment. There should be more studies on treatment of anorectal dysfunction.
3. If the patient has IIEF less than 14 (max 30), a urologist consultation should be recommended.
4. If the patient postoperatively has sexual dysfunction – a psychosexologist consultation should be prescribed.
5. Special urogenital and anorectal dysfunction centres should be established to inform the public about these issues, diagnostics with standardized questionnaires, and treatment.

6. LIST OF DISSERTATION-RELATED SCIENTIFIC PUBLICATIONS AND PRESENTATIONS

Articles:

1. **Dulskas A**, Klimovskij M, Vitkauskiene M, Samalavicius NE. The effect of coffee on the length of postoperative ileus following elective laparoscopic colectomy – a randomized prospective single centre study. *Dis Colon Rectum* 2015;58:1064–1069
2. **Dulskas A**, Samalavicius NE. A prospective study of sexual and urinary function before and after total mesorectal excision. *Int J Colorectal Dis* 2016;3:1-6
3. **Dulskas A**, Samalavicius NE, Gupta RK, Kilius A, Petrulis K, Samalavicius RS, Tikuisis R. Functional and clinical outcomes of hand-assisted laparoscopic colorectal surgery: a single-institution experience in 255 patients. *Eur Surg* 2015;47:75–80
4. Samalavicius NE, **Dulskas A**, Lasinskas M, Smailyte G. Validity and reliability of Lithuanian low anterior resection syndrome score. *Tech Coloproctol* 2016;20:215–220
5. **Dulskas A**, Samalavicius NE. The usefulness of anorectal manometry for diagnosing continence problems after low anterior resection. *Ann of Coloproctol* 2016;32:101-104
6. **Dulskas A**, Miliauskas P, Tikuisis R, Escalante R, Samalavicius NE. The functional results of radical rectal cancer surgery. *Acta chirurgica Belgica* 2016;116(1):1-10.
7. Tikuisis R, Miliauskas P, Lukoseviciene V, Samalavicius NE, **Dulskas A**, Zabuliene L, Zabulis V, Urboniene J. Transversus abdominis plane block for post-operative pain relief after hand-assisted laparoscopic colon surgery: a randomized, placebo-controlled clinical trial (Epub ahead of printing)
8. **Dulskas A**, Klimovskij M, Vitkauskiene M, Samalavicius NE. Does coffee affect the duration of postoperative ileus following elective laparoscopic colectomy? A

randomized prospective single-center study. Preliminary results. *Lithuanian Surgery*, 2014;13(2):104–110.

Presentations:

1. Dulskas A “Does coffee intake decrease postoperative ileus after elective laparoscopic colectomy? A single centre randomized control clinical trial”. VIIIth triennial meeting of Lithuanian Society of Coloproctologists with joint Lithuanian–Korean Colorectal Society sessions and a session of the International Society of University Colon and Rectal Surgeons. Vilnius, 2014.04.24-25.
2. Dulskas A “Functional results after rectal cancer treatment”. *Mayo clinic days Vilnius 2015 International Digestive System Cancer Conference*. Vilnius, 2015.05.15.
3. Dulskas A “The functional results of radical rectal cancer surgery” Lithuania-Korea Joint Symposium. Seoul, 2015.09.14.

7. SUMMARY IN LITHUANIAN

Darbo aktualumas

Tiesiosios žarnos vėžys (TŽV) išlieka viena dažniausių onkologinių ligų išsivysčiusiose Vakarų valstybėse. Vakarų šalyse 2012 metais buvo nustatyta apie 360 000 naujų TŽV atvejų. Mirtingumas siekia apie 180 000 pacientų. Europoje kasmet diagnozuojama apie 130 000 naujų TŽV atvejų, mirtingumas – 60 000. Lietuvoje sergamumas šios lokalizacijos vėžiu taip pat sparčiai didėja. 2012 metais Lietuvoje buvo diagnozuota apie 700 naujų TŽV atvejų, o sergamumas TŽV buvo 22,2/100000 gyventojų. Mirtingumas siekia apie 50 proc.

Ilgą laiką svarbiausiais TŽV operacinio gydymo rodikliais buvo laikoma išgyvenamumas, atkryčių skaičius ar komplikacijų dažnis. Dažniausiai tik šie rodikliai ir buvo tiriama ankstesniuose tyrimuose. Jau nuo praėjusio amžiaus vidurio yra žinoma, jog tuštinimosi, kaip ir seksualinė bei šlapinimosi funkcijos priklauso nuo dubens autonominių nervų ir rezginių vientisumo. Ilgą laiką šių nervų pažeidimai operuojant TŽV buvo laikomi neišvengiamais. Tačiau pagerėjusi operacinė technika bei totalinė mezorektalinė ekscizija (TME), kurią aprašė *R.J. Heald*, ženkliai sumažino lokalaus TŽV recidyvavimo dažnį, o pagerėjus pacientų pooperaciniam išgyvenamumui, publikuojama vis daugiau straipsnių, kuriuose analizuojamas ne tik piktybinio naviko šalinimo radikalumas, bet ir gyvenimo kokybė. Gyvenimo kokybė po TŽV radikalaus operacinio gydymo labiausiai priklauso nuo tuštinimosi, šlapinimosi ir seksualinės funkcijos. Dažniausiai pasireiškiantis tuštinimosi funkcijos sutrikimas apima padažnėjusį tuštinimąsi, nereguliarų tuštinimąsi, išmatų nesulaikymą ar nelaikymą ir pasunkėjusį tuštinimąsi. Pastarieji du sutrikimai paprastai yra daugiaveiksniai. Jie priklauso nuo sutrikusios tiesiosios žarnos rezervuarinės funkcijos ir jutimų, vidinio analinio rauko pažeidimo ir rektoanalinio slopinamojo reflekso išnykimo. Tuo tarpu seksualinės ir šlapinimosi funkcijų sutrikimą paprastai lemia dubens organų vienokio ar kitokio laipsnio pažeidimai operacijos metu. Dažniausiai šlapinimosi disfunkcija pasireiškia stresiniu šlapimo nelaikymu, dažnu šlapinimusi, pilno pasišlapinimo nebuvimu, prarastu pilnos šlapimo pūslės jausmu, šlapimo nelaikymu esant perpildytai šlapimo pūslei.

Tiek pasaulyje, tiek ir Lietuvoje plačiai mokoma TME išsaugant nervus metodikos, tačiau urogenitalinė disfunkcija ir išmatų nelaikymas dėl nervų sužalojimo operacijos metu yra didžiulė problema. Skirtingų autorių duomenimis, seksualinės funkcijos sutrikimas po tiesiosios žarnos operacijų moterims pasireiškia nuo 10 iki 35 proc., o tarp vyrų – iki 88 proc. atvejų. Šlapinimosi funkcijos sutrikimas tiek vyrams, tiek moterims pasireiškia apie 10 proc., o tuštinimosi – iki 87 proc. atvejų. Nors dubens nervų, esančių virš apatinio hipogastrinio rezginio (simpatiniai nervai) identifikacija dažniausiai yra nesudėtinga, tačiau parasimpatinių ir simpatinių nervų, einančių gilyn į dubenį, suradimas yra komplikuoatas. Pažymėtina, kad nervus išsauganti operacija vis dar laikoma techniškai sunkia ir tarptautiniu mastu ši technika nėra pripažinta „auksiniu“ gydymo standartu.

Kadangi tiesiosios žarnos vėžio atvejų kasmet neženkliai daugėja, taip pat gerėja diagnostikos ir gydymo galimybės bei pacientų išgyvenamumas, todėl tampa svarbūs seksualinės, šlapinimosi ir tuštinimosi funkcijų rezultatai. Šiuo metu Lietuvoje pacientų seksualinės, šlapinimosi ir tuštinimosi funkcijų ištyrimas ir gydymas nėra standartizuotas. Todėl yra būtinas tinkamas, standartizuotas ištyrimas bei patvirtinti metodai šiems sutrikimams palengvinti ir gydyti.

Darbo tikslas

Nustatyti šlapinimosi, seksualinės bei anorektalinės funkcijos pokyčius ir jų įtaką gyvenimo kokybei pacientams, kuriems buvo atlikta radikali tiesiosios žarnos rezekcija dėl tiesiosios žarnos vėžio, bei įdiegti anketinius ištyrimo principus.

Darbo uždaviniai

1. Nustatyti šlapinimosi funkcijos sutrikimus po radikalaus tiesiosios žarnos vėžio chirurginio gydymo.
2. Nustatyti seksualinės funkcijos sutrikimus po radikalaus tiesiosios žarnos vėžio chirurginio gydymo.

3. Panaudojus pasaulyje paplitusią Wexnerio skalę ir naująjį porezekcinio storosios žarnos sindromo vertinimo klausimyną (jį patvirtinti naudojimui klinikinėje praktikoje) bei anorektalinės manometrijos tyrimą, įvertinti tuštinimosi funkciją ir iširti galimybes koreguoti jos pokyčius.
4. Įvertinti ankstyvuosius žarnyno funkcijos pokyčius po laparoskopinės storosios žarnos rezekcijos.

Ginamieji teiginiai

1. Po tiesiosios žarnos rezekcinės operacijos labai sutrinka šlapinimosi, seksualinė ir anorektalinė (tuštinimosi) funkcija.
2. Anorektalinės funkcijos sutrikimams vertinti yra tinkama mūsų išversta ir pritaikyta naudoti praktikoje porezekcinio tiesiosios žarnos sindromo skalė. Anorektalinė manometrija atliekama tik kaip papildomas tyrimas.
3. Kava aktyvina žarnyno motoriką po gaubtinės ir tiesiosios žarnos operacijų.

Darbo mokslinis naujumas ir praktinė reikšmė

Lietuvoje buvo atliktas panašus tyrimas pacientų, kuriems buvo atliktas radikalus tiesiosios žarnos vėžio chirurginis gydymas, gyvenimo kokybei vertinti. Tačiau jame nebuvo atsižvelgta į atskiras dubens organų sistemas. Tyrime buvo nagrinėjama anorektalinės disfunkcijos reikšmė pacientų, kuriems atlikta tiesiosios žarnos rezekcija, gyvenimo kokybei (dr. G. Rudinskaitė, 2004 metai). Dar vienas tyrimas atliktas 2011 metais. Tai perspektyvusis daugiacentris tyrimas, nagrinėjantis anorektalinę funkciją tiesiosios žarnos vėžiu sergantiems pacientams, kuriems atlikta skirtinga operacija. Tačiau šiam tyrimui taikytas pasaulyje labai retai naudojamas anorektalinės funkcijos vertinimo klausimynas, be to, ir čia tiriama tik viena iš dubens organų funkcijų. Taip pat anorektalinė funkcija vertinama atliekant skirtingas chirurgines žarnyno vientisumo atkūrimo operacijas [21].

Mūsų atliktame tyrime naudotas visiškai naujas porezekcinio tiesiosios žarnos sindromo klausimynas, kuris patvirtintas tik keliose pasaulio šalyse (Švedijoje, Danijoje, Ispanijoje, Vokietijoje bei Kinijoje). Šis klausimynas mūsų patvirtintas naudoti klinikinėje praktikoje.

Darbe, remiantis didžiausia laparoskopinių storosios žarnos rezekcinių operacijų patirtimi Lietuvoje, išanalizuoti žarnyno funkciniai rezultatai: laikas iki dujų išėjimo, pirmo pasituštinimo, apetito atsiradimo.

Ieškodami pigių ir efektyvių maistinių medžiagų, sumažinančių pooperacinio žarnų nepraeinamumo trukmę po laparoskopinės žarnyno operacijos dėl kolorektalinio vėžio, nustatėme, jog ir dekofeinizuota kava trumpina ši laikotarpį, t. y. skatina žarnų motoriką (šis atradimas yra skirtingas, nei rodo iki šiol atlikti klinikiniai tyrimai).

Tiriamieji ir tyrimo metodai

Tyrimui atlikti buvo gautas Vilniaus regioninio biomedicininų tyrimų etikos komiteto leidimas (Nr 158200-02-146-41). Pacientai pirmo apsilankymo metu pasirašė sutikimą dalyvauti tyrime. Norėdami kuo plačiau ištirti dubens organų disfunkciją po tiesiosios žarnos operacijų, į tyrimą įtraukėme 3 grupes (kohortas) pacientų, kurie gydėsi Nacionaliniame vėžio institute 2006 – 2014 metais. Naudoti tyrimo metodai:

- Anketinė pacientų apklausa (šlapinimosi funkcija vyrams tirta pritaikius tarptautinę prostatos simptomų skalę, moterims – Bristolio moterų apatinių šlapimo takų simptomų sutrumpintą klausimyną; seksualinė funkcija – vyrams taikyta tarptautinė erekcinės funkcijos skalė, moterims – seksualinės funkcijos indeksas; tuštinimosi funkcija tirta pagal Wexner ir LARS-LT skales
- Anorektlainė funkcija tirta atliekant anorektalinę manometriją
- Statistinė duomenų analizė atlikta naudojant SPSS programinės įrangos paketą

Išvados

1. Panaudojus tarptautinės priešinės liaukos simptomų skalę vyrams ir Bristolio moterų apatinių šlapimo takų simptomų klausimyną moterims, šlapinimosi

funkcijos sutrikimas nustatytas 8.3 proc. vyrų ir 11.1 proc. moterų, operuotų dėl tiesiosios žarnos vėžio.

2. Panaudojus tarptautinės erekcinės funkcijos skalę bei moterų seksualinės funkcijos indeksą, lytinės funkcijos sutrikimas nustatytas 27.8 proc. vyrų ir 11.1 proc. moterų, operuotų dėl tiesiosios žarnos vėžio. Vyrų tarpe – abdominoperinealinė rezekcija yra veiksnys, neigiamai veikiantis lytinę funkciją. Moterų tarpe ši koreliacija nenustatyta (galimai dėl mažo operuotų moterų skaičiaus).
3. Pirmą kartą Lietuvos koloproktologų praktikoje pritaikius naująją porezekcinio tiesiosios žarnos sindromo skalę, pacientams po tiesiosios žarnos vėžio operacijos anorektalinė disfunkcija nustatyta net 75 proc. Ši skalė yra daug tikslesnė nustatant LAR sindromą negu pasaulyje labai plačiai naudojama Wexner skalė. Anorektalinė manometrija atliekama tik kaip papildomas tyrimas.
4. Originalaus tyrimo metu nustatėme, jog kavos vartojimas teigiamai veikia žarnyno motoriką, taip sumažindama laikotarpį iki pasituštinimo ligoniams, kuriems atlikta laparoskopinė storosios žarnos rezekcija dėl vėžio.

PADĖKA

Nuoširdžiai dėkoju Nacionalinio vėžio instituto administracijai ir direktoriui prof. dr. Feliksui Jankevičiui už suteiktą galimybę ir paramą vykdant šį mokslinį darbą.

Esu ypač dėkingas mokslinio darbo konsultantui – prof.habil.dr. Narimantui Evaldui Samalavičiui, kuris uždegė žingeidumą mokslui. Dėkoju už diskusijas, visapusią globą, padaršimus, reiklumą, tobulumo siekiamumą.

Labai ačiū instituto kolegoms prof.dr. Janinai Didžiapetrienei ir dr. Giedrei Smailytei už bendradarbiavimą ir patarimus vykdant mokslinį darbą bei skelbiant rezultatus.

Esu labai dėkingas savo tėvams ir žmonai už visapusišką palaikymą ir supratimą.

Curriculum vitae

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Education: Vilnius University, Faculty of Medicine
2002 – 2008 medical doctor
2008 – 2009 internship
2009 – 2014 residentship in general surgery

Professional development: 2011 – general surgery (6 months) Aintree hospital (UK)
2012 – manometry (4 days) Bologna (Italy)
2012 – colorectal surgery (4 weeks) North Colombo Teaching Hospital, (Sri Lanka)
2013 – laparoscopic surgery (2 weeks) Groote Shuur Hospital (South African Republic)
2015 – transanal endoscopic microsurgery (1 week) Knittlingen (Germany)
2015 – surgical oncology (1 week) Salzburg (Austria)
2016 – laparoscopic and robotic surgery and surgical oncology (3 months) Yonsei University, Severance Hospital (South Korea)

Employment: since 2014, National Cancer Institute, surgical oncologist

Overall publications: 28

Memberships: Member of the Lithuanian Society of Coloproctologists and Society of Vilnius surgeons