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Original Article

Application effect of perioperative comprehensive nursing intervention on laparoscopic radical prostatectomy

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Abstract: Objective: To evaluate the efficacy of perioperative comprehensive nursing intervention for patients underwent laparoscopic radical prostatectomy (LRP). Methods: This is a prospective cohort study which recruited 112 patients treated with LRP from June 2017 to December 2018. The patients were divided into the observation group (n=56, received comprehensive nursing) and the control group (n=56, received conventional nursing) according to the random number table method. Clinical parameters, postoperative pain at 24 h, depression and anxiety of patients before and after the intervention, quality of life and nursing satisfaction at discharge as well as the incidence of postoperative complications were compared between the two groups. Results: Compared with the control group, the observation group had significantly shorter postoperative anal exhaust time, postoperative off-bed ambulation time and hospital stay, but significantly increased 48 h drainage volume (all P<0.05). The scores of visual analogue scales when resting, turning over and coughing in the observation group were significantly lower than those in the control group 24 h after operation. After nursing intervention for 1 week, scores of SAS and SDS in both groups obviously decreased compared with those before intervention, and they were significantly lower in the observation group than in the control group (all P<0.001). At discharge, scores of physical function, social function, psychological function, and quality of life of patients in observation group were significantly better than those in the control group (all P<0.05). The observation group had lower incidence of adverse reactions and higher nursing satisfaction when compared with the control group (both P<0.05). Conclusion: Comprehensive nursing intervention can benefit the patients treated with LRP for less postoperative pain and better emotion, better quality of life and fewer postoperative complications, which is worthy of clinical application.

Keywords: Comprehensive nursing intervention, laparoscopic radical prostatectomy, pain, poor psychological mood, quality of life

Introduction

Prostate cancer, with a high incidence secondary to lung cancer, accounts for 14% of all malignant tumors in males [1, 2]. In recent years, the detection rate of prostate cancer tends to increase due to the widespread detection of prostate-specific antigen (PSA) in China [3-5]. Currently, laparoscopic radical prostatectomy (LRP) plays a pivotal role and even becomes the first choice for the therapy of prostate cancer [6, 7]. However, LRP is difficult to manipulate under microscopy and is in need of experienced clinician for postoperative recovery [8, 9]. Inappropriate post-operative care would raise the incidence of complications including bleeding, urinary fistula, urinary incontinence, and erectile dysfunction [10, 11].

Comprehensive nursing intervention is a series of active nursing measures implemented by nurses during care process with the aim to achieve better therapeutic efficacy, which is beneficial to the prognosis of patients [12]. Comprehensive nursing intervention, widely-used in clinic, can effectively improve urinary incontinence for patients after LRP, and thus raises the quality of life. Therefore, some scholars point out that comprehensive nursing intervention could probably be a preferred nursing pattern in the perioperative period of LRP. The risk of adverse mental emotion is high in post-

operative patients. The reason may be that most prostate cancer are the elderly males, of whom the body functions degenerate, and the postoperative pain is the another negative factor. Hence, a rational nursing pattern administrated to improve adverse mental state and decrease complication rate is critical and necessary.

Therefore, this study aimed to investigate the effect of the comprehensive nursing intervention in perioperative period of patients underwent LRP, especially on adverse mental states, pain as well as postoperative complications.

Materials and methods

General information

A prospective cohort study was performed. A total of 112 patients treated with LRP at Qingdao Central Hospital from June 2017 to December 2018 were selected and divided into observation group (n=56, received comprehensive nursing) and control group (n=56, received conventional nursing) according to the random number table method. The study was approved by the Medical Ethics Committee of Qingdao Central Hospital.

Inclusion criteria: Patients with the age from 50 to 75 years old; patients who were diagnosed with prostate cancer through ultrasound-guided prostate biopsy; patients without contraindications against surgery; patients who were treated by LRP; patients who could tolerant the pain in normal level; patients who signed the informed consent form.

Exclusion criteria: Patients with tumor infiltration to surrounding organ and lymph node or bone metastasis that confirmed by preoperative CT or intraoperative dissection of lymph node; patients with coagulation dysfunction; patients who could not tolerate the surgery due to cardiac, pulmonary or renal dysfunction; patients with psychiatric disease; patients with cognitive dysfunction.

Methods

Patients in control group were administered with regular nursing. Prior to surgery, various examinations were accomplished, such as blood routine test, coagulation function, hepatorenal function, blood sugar, chest radiograph, electrocardiogram, etc. The vital signs (blood pressure, respiration, heart rate) during the perioperative period were regularly monitored. Routine medicine guidance was offered during hospitalization. Adverse effects following the operation were carefully symptomatically treated.

Comprehensive nursing intervention was applied in patients of observation group. (1) The examinations were also accomplished prior to surgery. (2) Preoperative psychological care: before the operation, relevant knowledge of LRP was patiently introduced to patients and their families; moreover, successful cases were discussed to boost the patients' confidence in overcoming the disease; in order to reduce the patients' fear and make patients in the best status for operation, nurses would actively and frequently communicate with the patients and calm their mood. (3) Preoperative bowel preparation: patients were required to have a semi-liquid diet 3 days before the operation; two days before the surgery, enema was performed once per day with gentle action to avoid injury on rectal mucosa and perianal skin. (4) Intraoperative nursing: the vital signs (blood pressure, respiration and heart rate) were monitored throughout the surgery and the dosage of anesthetic drugs was timely adjusted accordingly. (5) Basic post-operative nursing: continuous electrocardiograph monitoring was utilized and the anal exhaust time, abdominal distention or pain, blood or fluid oozing at incision were observed. (6) Postoperative drainage tube nursing: the patients were asked not to bend, twist, or fold the drainage tube and the daily drainage volume and color change of drainage fluid were recorded. (7) Postoperative complication nursing, which is particularly important: the semi-sitting position of patients was carried out as early as possible; relatives were required to massage both lower limbs of patients to prevent venous thrombosis, and to assist patients in turning over frequently to keep them from pressure ulcer; patients were encouraged to practice deep breathing; the assistance on expectoration was provided to them and the respiratory tract was cleaned timely to prevent pulmonary infection; nursing staffs guided the patients to perform pelvic floor muscle exercises to avoid postoperative urinary incontinence; for patients with urinary incontinence already, the pad was replaced in

Table 1. Baseline characteristics (n, $\bar{x}$ ± sd)

Characteristics	Observation group (n=56)	Control group (n=56)	χ^2/t	P
Age (year)	64.5±4.3	63.7±4.1	1.008	0.316
BMI (kg/m^2)	22.57±2.75	23.11±3.28	0.944	0.347
Basic disease			1.256	0.534
Hypertension	47	42		
Hyperlipidemia	21	26		
Diabetes	24	19		
PSA (ng/mL)	28.77±8.70	26.40±7.06	1.583	0.116
Pathological stage			0.325	0.850
T1	15	17		
T2	31	28		
T3	10	11		
Visit reason			1.810	0.404
Elevated PSA in physical exam	9	10		
Dysuria	31	36		
Urinary retention	16	10		

Note: BMI: body mass index.

time to prevent eczema. (8) Postoperative pain care: Patients would experience incisional pain when the effect of anesthetization disappeared. Generally, pain intensity is strongest within 24 h after surgery. For patients with severe pain, an infusion pump was applied to relieve surgical pain. If patients still suffer from strong pain 3 days after the operation, the nurses should check the incision carefully to make sure if the incision was infected or bandage was too tight, instead of increasing the dosage of anesthetics.

Outcome measures

(1) Clinical indicators were compared between the two groups, including postoperative anal exhaust time, out of bed times, drainage volume of 48 h, hospital stays. (2) The degree of pain 24 h after surgery was evaluated with the visual analogue scale (VAS). The VAS was scored on a scale of 0-10, and the low score indicated light pain. The VAS scores at rest, in turning over and at coughing were compared separately. (3) Before and 1 week after intervention, the self-rating depression scale (SDS) and the self-rating anxiety scale (SAS) were used to assess depression and anxiety separately. SAS/SDS scores ≥50 indicated depression and anxiety symptoms, and the high scores indicated serious condition. (4) At discharge, Generic Quality of Life Inventory-74 (GQLI-74) was used to evaluate the quality of life of patients from four aspects: somatic function, social function, psychological function, and material living status. The high scores indicated good quality of life. (5) The incidence of postoperative complications were compared between the two groups, including secondary hemorrhage, anastomotic stenosis, rectal injury, cystospasm, urinary fistula, urinary incontinence, erectile dysfunction, lower limb vein thrombosis, pressure ulcer, pulmonary infection and incision infection. The incidence of complications (%) = the number of cases with complications/total cases × 100. (6) Home-made satisfaction survey scales were filled out by patients at discharge to assess nursing satisfaction. The degree of satisfaction was divided into satisfied (90-100 points), basically satisfied (60-89 points), and unsatisfied (<60 points). The nursing satisfaction rate (%) = number of (satisfied cases + basically satisfied cases)/total number of cases × 100.

Statistical analysis

Statistical analyses were performed using SPSS 20.0. Enumeration data were presented as n/% and analyzed by χ^2 test or the Fisher exact probability method. Measurement data conforming to a normal distribution were expressed as mean ± standard deviation ($\bar{x}$ ± sd); for the comparison within a group, paired t tests were used; for the comparison between groups, independent t-test was adopted. P<0.05 was considered as statistically significant.

Results

General data analysis

There were no significant differences in age, body mass index, basic disease, PSA level, pathological stage, and visit reason between the two groups (P>0.05). See **Table 1**.

Table 2. Clinical indicators ($\bar{x}$ ± sd)

Indicators	Observation group (n=56)	Control group (n=56)	t	P
Postoperative anal exhaust time (h)	8.88±1.54	9.47±1.33	2.170	0.032
Out of bed time (d)	2.5±1.0	3.0±1.1	2.517	0.013
Drainage volume of 48 h (mL)	170.76±21.07	159.80±18.73	2.909	0.004
Hospital stay (d)	14.4±2.1	15.7±2.5	2.980	0.004

Table 3. VAS scores after intervention ($\bar{x}$ ± sd)

Group	Rest	Turning over	Cough
Observation group (n=56)	3.04±0.88	3.54±1.05	4.89±1.26
Control group (n=56)	3.46±1.02	4.05±1.11	5.45±1.27
t	2.333	2.498	2.342
P	0.021	0.014	0.021

Note: VAS: visual analogue scale.

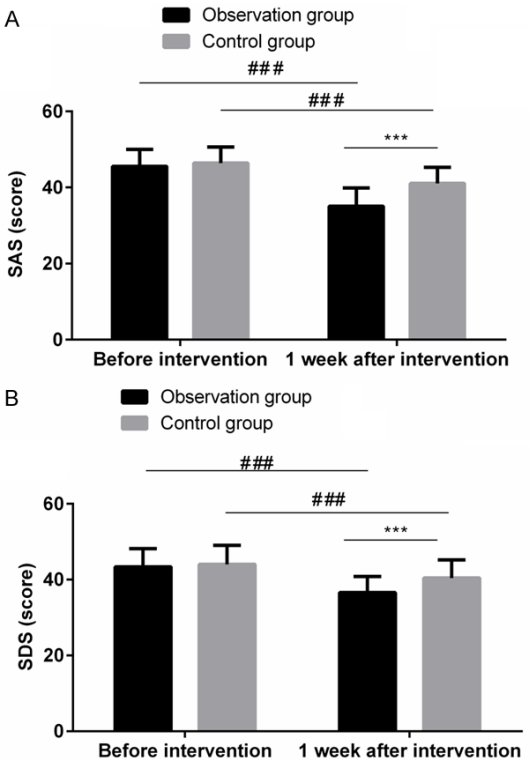

Figure 1. SAS and SDS scores were compared before and after intervention. A: Comparison of SAS scores; B: Comparison of SDS scores. Compared to those prior to intervention, ###P<0.001; Compared with those in control group, ***P<0.001. SDS: self-rating depression scale; SAS: self-rating anxiety scale.

Patients with comprehensive nursing intervention had better clinical indicators

Compared to the control group, postoperative anal exhaust time, out of bed time and hospital stay of patients in the observation group were obviously shorter, while the drainage volume of 48 h post-operation were markedly larger (P<0.05). See **Table 2**.

Patients with comprehensive nursing intervention had lower VAS scores after nursing

VAS scores at rest, in turning over, and at coughing of patients in observation group were significantly lower than those in control group 24 h after operation (P<0.05). See **Table 3**.

Patients with comprehensive nursing intervention had lower SAS and SDS scores after nursing

One week after the intervention, both SAS and SDS scores were obviously lower than those before intervention. The observation group had significantly lower SAS and SDS scores than the control group (all P<0.001). See **Figure 1**.

Patients with comprehensive nursing intervention had higher quality of life at discharge

Scores of somatic function, social function, psychological function and material living status of patients in observation group at discharge were significantly higher than those in the control group (P<0.05). See **Table 4**.

Patients with comprehensive nursing intervention had lower incidence of postoperative complications

In the control group, more complications occurred in patients, including secondary hemorrhage (2 cases), anastomotic stenosis (1 case), cystospasm (2 cases), urinary incontinence (4 cases), erectile dysfunction (2 cases) and incision infection (2 cases). No other complications appeared, such as rectal injury, urinary fistula, lower limb vein thrombosis, pressure ulcer, and pulmonary infection.

In the observation group, there were 1 case of cystospasm, 2 cases of urinary incontinence

Table 4. Quality of life scores at discharge ($\bar{x}$ ± sd)

Factors	Observation group (n=56)	Control group (n=56)	t	P
Somatic function	50.95±5.40	49.01±4.88	1.995	0.049
Social function	55.55±6.37	52.20±5.50	2.979	0.004
Psychological function	60.06±5.50	56.70±6.03	3.081	0.003
Material living status	63.33±5.40	60.96±4.80	2.455	0.016

Table 5. Postoperative complications (n (%))

Complication	Observation group (n=56)	Control group (n=56)	χ^2	P
Secondary hemorrhage	0 (0.00)	2 (3.57)	0.509	0.476
Anastomotic stenosis	0 (0.00)	1 (1.79)	0.000	1.000
Cystospasm	1 (1.79)	2 (3.57)	0.000	1.000
Urinary incontinence	2 (3.57)	4 (7.14)	0.176	0.675
Erectile dysfunction	1 (1.79)	2 (3.57)	0.000	1.000
Incision infection	0 (0.00)	2 (3.57)	0.509	0.476
Overall incidence	4 (7.14)	13 (23.21)	5.617	0.018

Table 6. Satisfaction rates (n (%))

Groups	Satisfied	Basically satisfied	Unsatisfied	Satisfaction rate
Observation group (n=56)	27 (48.21)	26 (46.43)	3 (5.36)	53 (94.64)
Control group (n=56)	17 (30.36)	28 (50.00)	11 (19.64)	45 (80.36)
χ^2	3.743	0.143	5.224	5.224
P	0.053	0.705	0.022	0.022

and 1 case of erectile dysfunction after the operation. No other complications occurred, such as secondary hemorrhage, anastomotic stenosis, rectal injury, urinary fistula, lower limb vein thrombosis, pressure ulcer, pulmonary infection, and incision infection.

The incidence of complications of the observation group was 7.14%, which was significantly lower than that in the control group (23.21%, P<0.05). See **Table 5**.

Patients with comprehensive nursing intervention had higher nursing satisfaction rate

At discharge, the satisfaction rate was 94.64% in observation group, which was significantly higher than that in the control group (80.36%, P<0.05). See **Table 6**.

Discussion

Compared with the routine care, comprehensive nursing intervention has its unique advantages. For example, it reduces the risk of complications and promotes the postoperative recovery of patients through providing comprehensive systematic and special nursing to patients in preoperative, intraoperative, and postoperative periods [13, 14]. In this study, the patients received the comprehensive nursing intervention showed better clinical indictors compared with those received conventional nursing. Rabbani et al. also suggested that the comprehensive nursing intervention contributed to shortening hospital stay and improving the postoperative recovery of LRP patients, which was consistent with this study [15].

In addition, the preoperative nursing measures in the comprehensive nursing intervention used in Qingdao Central Hospital contained, but not limited to, various examinations, preoperative psychological care, and preoperative bowel preparation. For intraoperative care, ECG monitoring was performed throughout the surgery. Postoperative care included, but not limited to, basic care, postoperative drainage tube nursing, postoperative complication care, and postoperative pain care. This care pattern runs through the preoperative, intraoperative and postoperative processes, covering not only basic care but also targeted nursing interventions based on condition of individuals, such as offering psychological counseling for patients with poor mental state in time. Meanwhile, at different stages of the treatment, the nurses would provide different nursing serves. For example, preoperative nursing focused on preoperative preparation and psychological care, while postoperative nursing focused on the care of complications and pain, so as to benefit the patients from rehabilitation. Therefore, comprehensive nursing intervention application in the perioperative period of LRP can facil-

itate rehabilitation and decrease the hospital stay.

Patients with cancer are always in a bad psychological state, which can be worsened by many factors including illness distress, concerns about surgery risk, the torment of cancer pain and postoperative pain [16-18]. Therefore, postoperative pain nursing is particularly important. Normally, due to diminished anesthetic effect 24 h after surgery, patients suffer the most severe pain and need a rational anesthetic method. In our study, the observation group had significantly lower SAS and SDS scores 1 week after the intervention, and significantly lower VAS scores 24 h after operation when compared to the control group. In addition, GQLI-74 scores at discharge were significantly higher than those in the control group. The study reported by Touijer et al. was consistent with our results [19]. The possible reason may be that the comprehensive nursing intervention pays attention to the psychological counseling and postoperative pain care. Moreover, it is the preoperative communication and the introduction of successful LRP cases to patients that could calm the nervous mood of the patient, relieve patients' psychological fear and increase their confidence in conquering diseases. However, for patients with spontaneous pain 3 days after surgery, the nurses should screen the causes of pain such as incisional infection or too tight bandaging, instead of increase the dosage of anesthetics, so as to avoid the delay of treatment. Therefore, comprehensive nursing intervention is beneficial for patients underwent LRP to alleviate pain, improve poor mental states (depression, anxiety) and promote the quality of life.

Postoperative complication nursing is an important part of comprehensive nursing interventions. This process requires the cooperation of patients and their families, which consists of postural care, airway clearance to avoid respiratory infection, turning over to prevent pressure sores, lower extremities massage to prevent venous thrombosis, and pelvic floor muscle training to prevent postoperative urinary incontinence. Previous studies reported that effective nursing interventions contribute to a low rate of postoperative complications [20, 21]. In our study, we also found that the incidence of complications was significantly lower in the observation group than that in the control group. At last, nursing satisfaction rate of patients for the two nursing interventions was assessed. The satisfaction rate was significantly higher in the observation group than in the control group. Hence, the risk of postoperative complications can be reduced through comprehensive nursing interventions applied in perioperative period of LRP, which was closely related to the improvement of life quality and promotion of postoperative recovery.

However, the sample size of the present study is small, and follow-up information was absent. Future research with large sample size and long period of follow-up is needed to confirm the feasibility and significance of this nursing intervention.

In summary, comprehensive nursing interventions administrated in LRP perioperative period can relieve patients' pain, improve undesirable psychological states, and reduce the risk of postoperative complications, thus improving the quality of life and promoting postoperative recovery.

Disclosure of conflict of interest

None.

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