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Original Article

Application and nursing key points of wet dressings on the intestinal stoma after enterostomy

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Abstract: Patients with severe intestinal injury caused by trauma and malignant intestinal diseases require an artificial anus to be established through enterostomy to replace the original perineal anus for defecation. Although enterostomy has brought a new way of defecation to patients, the nursing requirements for an intestinal stoma after enterostomy are high. If complications arise from improper postoperative wound care, the quality of life of patients will be seriously reduced, and the psychological burden will be aggravated. This study compared the nursing effect of wet dressings and traditional dry dressings on patients undergoing enterostomy. Results showed that compared to patients using dry dressings, patients who used wet dressings had significantly lower postoperative dressing change frequency and complication rate, less pain during dressing change, and shorter hospital stays and intestinal stoma incision healing time. This suggests that wet dressings can promote wound healing in patients with enterostomy. In addition, it was found that compared to patients using dry dressings, the postoperative sleep quality, mood score, and quality of life of patients using wet dressings were significantly better. Evaluation of patient care comfort and satisfaction revealed that patients who used wet dressings felt significantly more comfortable and satisfied with their care than those who used dry dressings. Therefore, this study argues that wet dressings can facilitate the wound healing of the intestinal stoma in patients with enterostomy more than dry dressings, and better alleviate the bad moods and improve the quality of life of patients. Wet dressing can be used as a preferred nursing method for patients undergoing enterostomy.

Keywords: Wet dressing, enterostomy, quality of life, nursing effect

Introduction

Enterostomy is a common method to treat severe intestinal injury caused by trauma and malignant intestinal diseases. Changes in people's living and eating habits have led to increased incidence of intestinal malignant disease, which in turn results in an increasing application of enterostomy in clinical practice [1, 2]. When performing enterostomy, it is necessary to make an opening in the patient's abdominal wall, pull out a section of intestine, turn it over, and fix it to the patient's abdominal wall with sutures to replace the original perineal anus for defecation [3]. Although enterostomy brings a new way of defecation to patients, the nursing requirements for the intestinal stoma after enterostomy are relatively high. Complications caused by improper postoperative wound care will seriously reduce the quality of life of patients, aggravate the psychological burden, and increase the length of hospital stay and treatment costs [4-6]. Infection of the stoma may indicate a need for a second operation and can even lead to the development of a prophylactic stoma into a permanent intestinal stoma that will accompany the patient life-long [7, 8]. As we all know, good perioperative care is essential to promote patients' physical and mental health. Therefore, choosing suitable wound dressings for patients undergoing enterostomy and providing good perioperative care will help to maximize the effectiveness of surgical treatment for patients.

Dressing refers to the material assisting the main material in clinical practice, and the traditional dressing refers to medical hemostatic

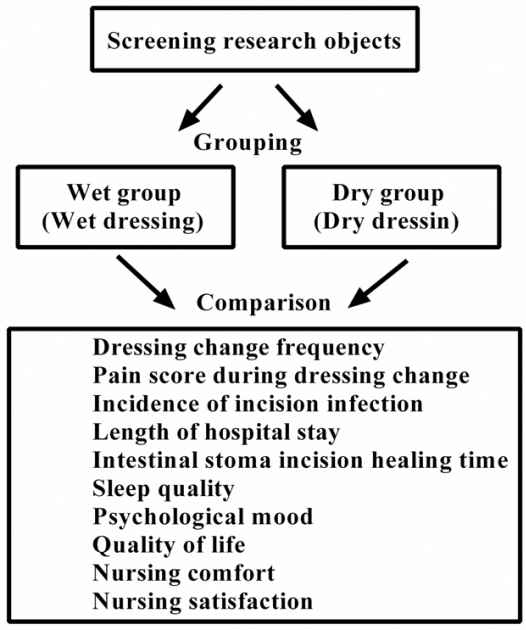

Figure 1. Research flow chart.

gauze. With people's increasing attention to and requirements for wound healing and the advances in dressing change technology, dressings have also developed by leaps and bounds [9, 10]. There are many types of modern wound dressings, mainly including hydrocolloid dressings, interactive wound dressings, and foam dressings. In order to keep the wounds dry after surgery, dry dressings were clinically used to treat wounds. However, in clinical practice, it has been found that dry dressings are not completely attached to the wound skin, which can easily lead to bacterial invasion and infection [11, 12]. Proper humidity can prevent the dressing from adhering to the new granulation tissue of the wound, thereby reducing wound damage caused by dressing replacement [13]. Common wet dressings include alginate dressings, hydrogel dressings, and silver ion dressings. As early as 1976, Levine and other scholars showed that wet dressings could better improve the appearance of patients' wounds than dry dressings [14]. A number of previous studies have confirmed the application of wet dressings in various wound diseases, for example, wet dressings have been proven to promote the healing of diabetic foot ulcers, burns, and trichoderma [15-17]. However, no investigation has been conducted on the effects of wet dressings on pain during dressing change, postoperative sleep quality, life quality, nursing comfort and satisfaction of patients with enterostomy. The nursing focus of wet dressings for enterostomy patients is also rarely studied.

Therefore, the purpose of this study was to explore the value of wet dressings in the postoperative nursing of patients undergoing enterostomy. At the same time, in order to improve the perioperative nursing for patients with enterostomy, we put forward corresponding nursing measures, hoping to provide a reference for reducing the complications of enterostomy.

Materials and methods

Research process

We selected 112 patients who underwent enterostomy in the Department of Gastroenterology, Harbin Medical University Cancer Hospital from January 2020 to June 2020 as the research participants. Patients treated with hydrogel dressings, alginate dressings and silver ion dressings to care for the intestinal stoma and surgical incisions were assigned to the wet group (n = 56), while those using traditional sterile gauze was used as the dry group (n = 56). Inclusion criteria: (1) Patients underwent enterostomy in our hospital due to malignant bowel diseases; (2) Patients who had follow-up treatment in our hospital after operation; (3) Patients with the Chinese reading and writing skills required to fill out the questionnaire independently; (4) Patients with clear postoperative consciousness to complete the questionnaire survey. Exclusion criteria: (1) Patients with cognitive dysfunction or mental illness; (2) Patients who quit the research halfway; (3) Other diseases that seriously affect the patient's sleep quality or quality of life. This was a retrospective study, which was approved by the ethics committee of the Harbin Medical University Cancer Hospital (No. 110902 [2019]). All enrolled subjects were informed of the study and signed an informed consent form. The research flow chart is shown in **Figure 1**.

Dressing method

Both groups of patients took the supine position to fully expose the intestinal stoma. The stoma was cleaned with normal saline, and the healing dressing was applied under dry skin condition. The wet group applied wet dress-

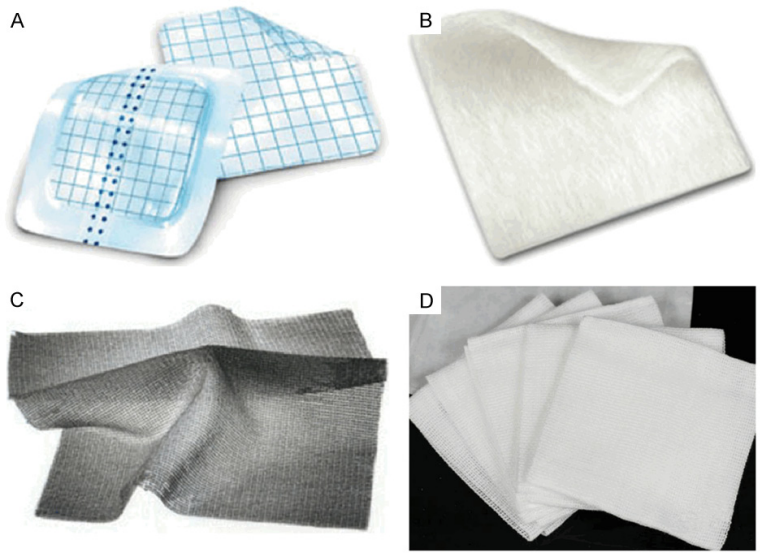

Figure 2. Different dressings for enterostomy care. A-C. Hydrogel dressing, alginate dressing, and silver ion antibacterial dressing. D. Sterile gauze.

ings: Corresponding wet dressing was selected according to the patient's wound condition. Hydrogel dressings (20172640050) were preferred if the patient had less wound exudate. Alginate dressings (20172640048) were used if the patient had more wound exudate. If the patient's wound had more exudate and suspected symptoms of infection, bacterial culture was required. If infection was confirmed, silver ion antibacterial dressings (20152640209) were applied (the three types of wet dressings are all purchased from Jierui Medical Products Co., Ltd., Weihai, China, and are shown in **Figure 2A-C**). The dry group used dry dressings (Zhende Medical Products Co., Ltd., Shaoxing, China, 20172640128): Sterile cotton balls were used to stop bleeding and the wound was bandaged with sterile gauze and adhesive tape (the dry dressing is shown in **Figure 2D**). In both groups, leak-proof cream was applied at the interface between the intestinal stoma and the incision, and the ostomy bag was attached. The skin around the stoma, stoma color, fluid leakage, and swelling were observed regularly. In case of infection, corresponding anti-infection treatment was carried out in time.

Outcome measures

Nursing effects of different dressings on patients with enterostomy: The dressing change frequency during hospitalization, pain during dressing change, incidence of incision infection, length of hospital stay, and intestinal stoma incision healing time were recorded in both groups. Among them, the pain score of the patient during dressing change was evaluated by the visual analogue scale (VAS). VAS is done by drawing a 10 cm long horizontal line on the paper with 10 equal parts. The beginning of the horizontal line is marked as 0 and the end is marked as 10. The greater the value of the mark, the higher the level of pain. The patient drew a mark on the horizontal line according to his/her own feelings to indicate his/her pain during dressing change [18].

Sleep quality assessment during the patient's hospitalization: The Pittsburgh Sleep Quality Index (PSQI) was used to evaluate the sleep status of patients during hospitalization after enterostomy [19]. The PSQI contains a total of 5 other-rated items and 19 self-assessed items, among which the first 18 self-assessed items are scored. These 18 items can comprehensively evaluate the patient's sleep quality from 7 aspects: sleep quality, sleep latency, sleep time, sleep efficiency, sleep disorders, hypnotic drugs, and daytime sleep. Each dimension uses a 4-level scoring method (0 to 3 points), with a total score of 0 to 21 points, and the score is inversely proportional to the patient's sleep quality. At present, most studies use 7 points as the dividing line for evaluating patients' sleep quality; that is, patients with a score >7 are rated as having poor sleep quality.

Emotional assessment of patients during hospitalization: The Self-Rating Anxiety Scale (SAS) and Self-Rating Depression Scale (SDS) were used to assess the anxiety and depression of patients. The higher the score, the more anxiety and depression of the patient.

Quality of life assessment of patients during hospitalization: The quality of life during hospitalization was assessed and compared. Due to the particularity of the disease, the universal scale lacks stoma-related items and the specificity in assessing the quality of life of patients undergoing enterostomy, so the Chinese ver-

Table 1. Baseline data of patients

Factors	Wet group (n = 56)	Dry group (n = 56)	t/χ^2	P
Gender			0.346	0.556
Male	37 (66.07)	34 (60.71)		
Female	19 (33.93)	22 (39.29)		
Age	41.26 ± 7.16	42.74 ± 7.49	1.069	0.288
Type of enterostomy (cases)			1.347	0.510
Transverse colostomy	27 (48.21)	23 (41.07)		
Ileum or urological ostomy	19 (33.93)	18 (32.14)		
Sigmoid colostomy	10 (17.86)	15 (26.79)		
Body mass index	22.15 ± 2.31	21.45 ± 2.23		
Residence			1.287	0.257
Urban	41 (73.21)	44 (78.57)		
Rural	15 (26.79)	12 (21.43)		
Marital status			0.539	0.463
Married	53 (94.64)	51 (91.07)		
Not married	3 (5.36)	5 (8.93)		
Education level			0.929	0.335
High school and above	31 (55.36)	36 (64.29)		
Junior high school and below	25 (44.64)	20 (35.71)		
Smoking history			0.322	0.571
Yes	29 (51.79)	26 (46.43)		
No	27 (48.21)	30 (53.57)		
History of diabetes			0.439	0.508
With	6 (10.71)	4 (7.14)		
Without	50 (89.29)	52 (92.86)		
Hypertension			1.306	0.253
With	9 (16.07)	5 (8.93)		
Without	47 (83.93)	51 (91.07)		
Diameter of the stoma			0.036	0.850
≤4 cm	30 (53.57)	31 (55.36)		
>4 cm	26 (46.43)	25 (44.64)		

sion-City of Hope-Quality of Life-Ostomy Questionnaire (C-COH) [20] was used to evaluate the life of patients during hospitalization. C-COH contains 32 items in four dimensions: physical well-being, mental well-being, social well-being, and mental well-being. The Cronbach's α coefficient of the C-COH scale is 0.913, and the test-retest reliability is 0.904. Each dimension of the scale has a score of 0 (worst quality of life) to 10 points (best quality of life), and the total score is also 0 to 10 points (the total score of 32 items divided by 32).

Care comfort and satisfaction: The nursing comfort and satisfaction of patients were investigated using the self-made questionnaire the day before discharge (the full score of both is 100 points). Both on a 100-point scale, a score of >90 points indicates consciously comfortable/satisfied, 80-90 indicates relatively comfortable/satisfied, 60-80 indicates basically comfortable/satisfied, and <60 indicates not comfortable/satisfied.

Statistical analysis

SPSS 23.0 and GraphPad Prism 8.2 statistical software were used to analyze the data of this study. Quantitative data conforming to the normal distribution were represented by (x ± s); inter-group comparisons were made by the t-test, multiple time point comparisons between the two groups were performed by the repeated measures analysis of variance; multi-group comparisons were conducted by one-way Analysis of Variance, and pairwise comparisons between the two groups were performed by the SNA-Q test. The qualitative data were expressed as frequencies and percentages, and comparisons were made by the chi-square test. When the theoretical frequency was between 1-4, the chi-square was corrected. Ranked data were tested by the rank sum test. Differences with $P<0.05$ were considered significant.

Results and discussion

Baseline data

Comparing the baseline data, it was found that there was no significant difference in the gender, age, or type of intestinal stoma between the two groups (**Table 1**).

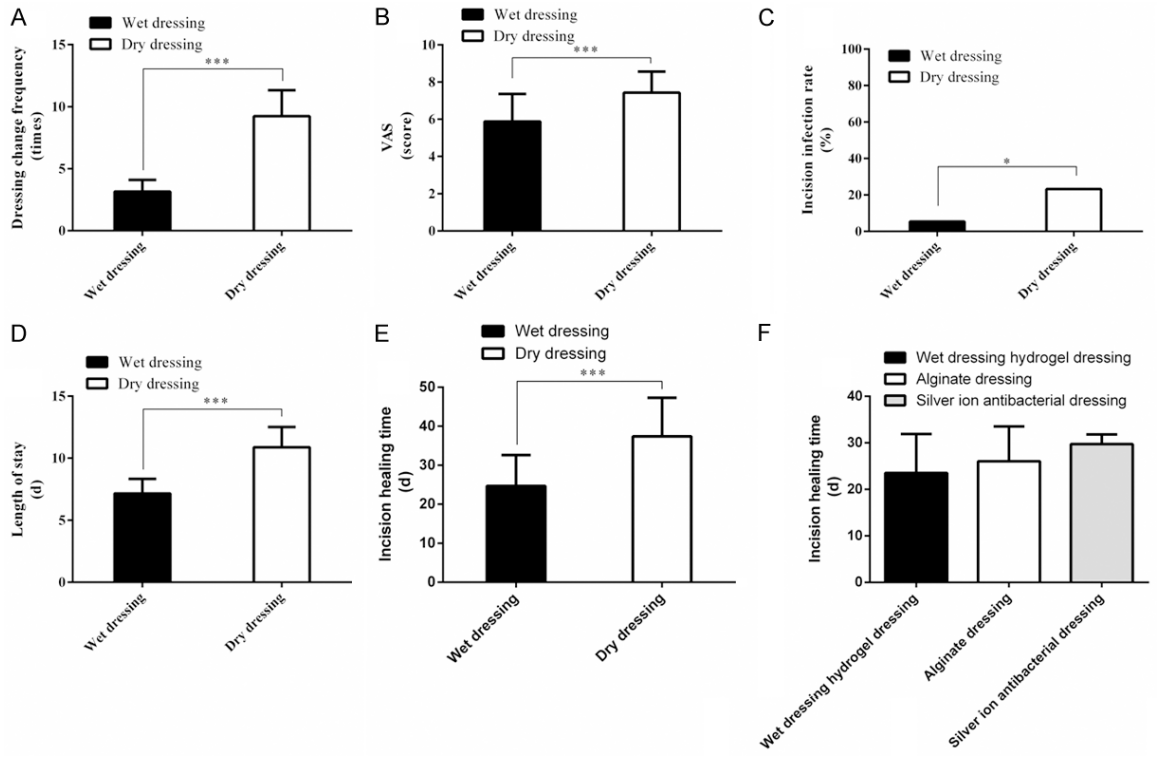

Figure 3. Comparison of the nursing effects of different dressings on patients. A. Comparison of dressing change frequency during hospitalization. B. Comparison of pain scores during dressing change. C. Comparison of incision infection rate. D. Comparison of length of hospital stay. E. Comparison of intestinal stoma incision healing time. F. Comparison of intestinal stoma incision healing time among patients with different wet dressings. Note: *P<0.05, **P<0.001.

Comparison of intervention effects between the two groups

In order to compare the nursing value of wet dressings and dry dressings for postoperative intestinal stoma and surgical incision in patients undergoing enterostomy, we compared the dressing change frequency, pain during dressing change, incidence of incision infection, hospitalization time, and intestinal stoma incision healing time between the two groups. The results showed that compared with patients who used dry dressings, those who used wet dressings had significantly fewer dressing changes during hospitalization, significantly reduced pain scores during dressing change and incision infections, and significantly shortened length of hospital stay and intestinal stoma incision healing time. In addition, there was no statistically significant difference in intestinal stoma incision healing time among patients using different wet dressings (hydrogel dressing, alginate dressing, and silver ion antibacterial dressing) (**Figure 3**).

Comparison of sleep quality of patients during hospitalization

In order to compare the sleep quality of patients with different dressings, we assessed patients' sleep quality during hospitalization before discharge using PSQI, a scale that can assess sleep quality in the most recent month. After comparison, we found that the scores of patients using wet dressings, in the five dimensions of sleep quality, sleep latency, sleep time, sleep disorders, and daytime sleep, were significantly lower than those using dry dressings. At the same time, the sleep quality scores of patients who used wet dressings were also significantly lower (i.e. better) than that of patients who used dry dressings (**Table 2**).

Patient's psychological and emotional changes

The SAS and SDS were used to observe the emotional changes of the two groups of patients. Before nursing, there was no significant difference in the SAS scores and SDS

Table 2. Comparison of patients' sleep quality

Item	Wet group (n = 56)	Dry group (n = 56)	t	P
Sleep quality	1.12 ± 0.32	1.29 ± 0.23	3.296	0.001
Sleep latency	0.87 ± 0.25	0.99 ± 0.18	2.970	0.004
Sleep time	0.93 ± 0.28	1.08 ± 0.25	3.107	0.002
Sleep efficiency	0.98 ± 0.19	1.06 ± 0.12	1.332	0.186
Sleep disorders	0.82 ± 0.11	1.01 ± 0.16	2.312	0.023
Hypnotic drugs	1.13 ± 0.12	1.29 ± 0.12	1.558	0.122
Daytime sleep	1.17 ± 0.24	1.67 ± 0.22	2.069	0.041
Total score	7.05 ± 0.60	7.71 ± 0.48	6.428	<0.001

scores between the two groups. After nursing, the SAS score and SDS score decreased significantly in both groups, and the scores of patients using wet dressings were significantly lower than those of patients using dry dressings (**Figure 4**).

Comparison of the quality of life of patients during hospitalization

The huge changes in the body image of patients with enterostomy will evidently bring huge adverse effects on their physical and psychological health. This study compared the psychological, physical, social and mental well-being scores of two groups of patients who used different dressings during hospitalization. It was found that the scores of all dimensions and the average scores of each item of patients who used wet dressings were significantly higher than those of patients who used dry dressings (**Table 3**).

Comparison of patient care comfort and satisfaction

The investigation and comparison of nursing comfort and satisfaction degree of patients during hospitalization revealed that the patients who used wet dressings had higher self-perceived nursing comfort and satisfaction than those who used dry dressings. It may be due to the fact that the wet dressings need to be changed every 3 days, and the reduced pain caused by dressing changes as the dressing change frequency was significantly lower than that of dry dressings (**Table 4**).

Discussion

The postoperative recovery period of patients with enterostomy can be divided into three stages: wound cleansing, granulation tissue proliferation, and epithelialization. In the process of postoperative hemostasis, due to vasodilation and increased vascular permeability, a large number of white blood cell particles gather at the wound and produce a variety of inflammatory mediators, which can easily lead to wound infection [21]. Therefore, the wound must be cleaned after the operation to prevent the accumulation of white blood cells and remove the necrotic tissue. After wound cleaning, effectively absorbing the excess fluid from the wound is the key to reducing wound infection.

Dry dressings have limited absorption capacity for wound discharge. Frequent dressing changes are needed if there is a lot of wound discharge, which will reduce the surface temperature of the wound and is not conducive to the proliferation of skin cells at the wound [22, 23]. In addition, dry dressings tend to adhere to wound tissue, and dressing changes can cause damage to wound tissue and surrounding skin. On the other hand, wet dressings such as alginate dressings can absorb exudate about 20 times their own volume, which can not only reduce the frequency of dressing changes and promote wound healing, but also reduce the traction and pain on the patient's wound caused by dressing changes [24, 25]. After surgery, the process of a large amount of new tissue growing from the surgical wound to fill the gap is called the granulation tissue proliferation period. During this period, the degree of wound moisturization has an important impact on the growth of new tissues. If the wound is too dry, the wound tissue will die from dehydration, which will slow down the rate of wound healing. It is also important to keep the wound properly moist during the stage of wound epithelialization. If the wound surface is dry, it will delay cell regeneration and thus delay the wound healing process. Therefore, keeping the wound warm and moisturized after operation can promote wound healing.

Scholars such as Jennings showed in the study that wet dressings wouldn't adhere to patients' wounds and could reduce the pain during dressing change [26]. Muthuramalingam be-

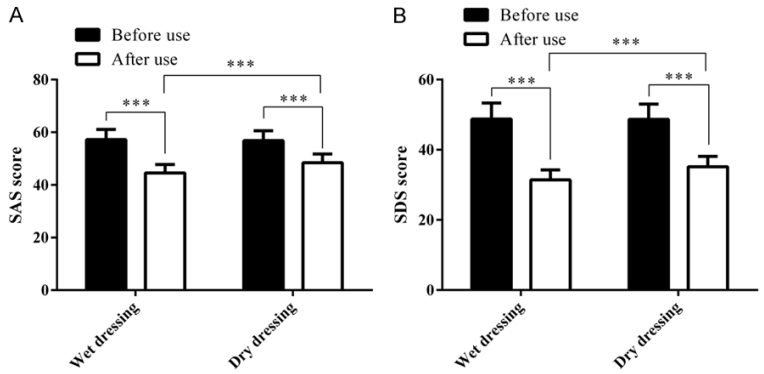

Figure 4. Psychological and emotional changes of patients. The SAS score (A) and SDS score (B) of patients using wet dressings were significantly lower than those of patients using dry dressings. Note: ***P<0.001.

Table 3. Comparison of quality of life scores

Item	Wet group (n = 56)	Dry group (n = 56)	t	P
Psychological well-being	5.14 ± 1.01	4.21 ± 0.82	5.349	<0.001
Physical well-being	6.68 ± 1.11	5.63 ± 0.89	5.523	<0.001
Social well-being	6.19 ± 0.95	5.07 ± 0.92	6.338	<0.001
Mental well-being	5.27 ± 0.89	4.13 ± 1.00	6.373	<0.001
Average score	5.82 ± 0.49	4.76 ± 0.48	11.562	0.007

Table 4. Comparison of patient care comfort and satisfaction

	Groups	Score			
		>90	80-90	60-80	<60
Degree of comfort	Wet group (n = 56)	21	23	11	1
	Dry group (n = 56)	10	17	27	2
	Z	-3.305			
	P	0.001			
Degree of satisfaction	Wet group (n = 56)	27	20	8	1
	Dry group (n = 56)	15	21	17	3
	Z	-2.749			
	P	0.006			

lieved that the moist state was conducive to the formation of wound capillaries and the release of active substances, thereby promoting wound healing [27]. In this study, compared with patients who used dry dressings, those who used wet dressings had significantly fewer dressing changes, significantly reduced pain scores during dressing change, and complication rates, and significantly shortened lengths of hospital stay and intestinal stoma incision healing time. This shows that the effect of wet dressings on postoperative care of patients undergoing enterostomy is better than that of dry dressings. Subsequently, the comparison of postoperative sleep quality and quality of life revealed significantly improved sleep and life quality of patients who used wet dressings. It is speculated that this may be related to the promotion of the wound healing effect of wet dressings, which reduces the patient's physical pain while reducing the patient's psychological burden. Therefore, this study suggests that the use of wet dressings in the nursing of postoperative intestinal stoma and surgical incisions in patients undergoing enterostomy can reduce the dressing change frequency, relieve pain during dressing change, shorten wound healing time, and improve the quality of life and nursing satisfaction of patients.

Enterostomy not only causes serious damage to the patient's body, but also brings negative effects to patients' life, psychology and social interaction due to changes in the defecation pathway. Therefore, in addition to routine care of the intestinal stoma and surgical incisions, this study also puts forward some nursing suggestions, hoping to provide references for improving the perioperative care of patients with enterostomy [28, 29], which includes: (1) Diet care. Due to the lack of sensory nerve and sphincter control of the intestinal stoma, it is difficult for the patient to control the gas and defecation of the stoma. Medical staff should pay close attention to the patient's intestinal peristalsis and help him/her to be familiar with how to proceed the intestinal stoma. In the early stage of recovery of intestinal function, a small amount of liquid food can be consumed to reduce the burden on the intestines. The patient may shift to a semi-liquid diet appropriately according to his/her gastrointestinal function recovery. The patient can return to a normal diet after the gas-

trointestinal function is fully recovered; but it is recommended to eat in the form of small and frequent meals, with easy-to-digest food as the main diet. (2) Psychological nursing. The psychological trauma caused by enterostomy to most patients is far greater than the physical trauma, which predisposes patients to obvious tension and anxiety after operation. If the negative mood is not relieved for a long time, it will have a serious adverse effect on the patient's treatment effect and quality of life. Therefore, medical staff should introduce the necessity of surgery to patients and their families before surgery, and help patients recognize and accept the changes brought about by surgery after surgery. Successful cases of good postoperative recovery can be introduced to patients to improve their confidence in recovery. At the same time, it is necessary to pay close attention to their psychological state and provide necessary psychological counseling to patients with obvious negative psychology. (3) Health education and discharge guidance. Nursing after enterostomy is difficult, and most patients have insufficient nursing ability to care for the intestinal stoma. Therefore, medical staff should train patients and their family members on enterostomy care before patients are discharged. The power-feedback method can be used to teach patients about enterostomy care methods, that is, to demonstrate the steps and methods of stoma care in detail to the patients through video explanations and special drills, and then let the patients repeat and demonstrate what they have learned. In addition, the medical staff should explain or correct the problems or errors encountered by the patient in the process of retelling and demonstrating, so as to deepen the patient's impression. After the patient is discharged from the hospital, the nursing staff can keep in touch via WeChat or phone, so as to answer the patient's questions in the process of enterostomy care in a timely manner. However, there are still some deficiencies in this study. First, no new dressings were used in the enterostomy for comparison. Second, basic experiments are warranted to verify the specific molecular mechanisms of wet dressings in enterostomy. These will be the focus of our future research.

Conclusion

To sum up, enterostomy causes serious damage to the patient's physical and mental health, and improperly cared for wounds are prone to infection, which seriously affects the quality of life of patients. This study found that patients who use wet dressings after enterostomy have significantly reduced dressing change frequency after surgery, reduced pain during dressing change and complication rate, as well as shortened hospital stay and intestinal stoma incision healing time. In addition, wet dressings are shown to improve the postoperative sleep quality and quality of life of patients with enterostomy. Moreover, it also improves the patient's satisfaction with nursing to a certain extent. Therefore, this study argues that wet dressings can be used as the preferred postoperative nursing dressings for patients undergoing enterostomy.

Disclosure of conflict of interest

None.

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