

Research Progress on Intervention Measures of Moisture-related Skin Injury Around Enterostomy

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Abstract: *This paper reviews the overview, current situation, influencing factors, evaluation tools and comprehensive management strategies of moisture-related skin injury around enterostomy, and is committed to improving the attention of clinical medical staff to moisture-related skin injury around enterostomy, and providing reference for improving moisture-related skin injury around enterostomy.*

Keywords: Enterostomy, Moisture-related skin injury around the stoma, Nursing, Summary.

1. Introduction

Colorectal cancer is one of the most common malignant tumors in China. According to the 2023 China Cancer Statistics Report [1], the number of new cases and deaths of colorectal cancer in China ranks first in the world every year. This high incidence is seriously affecting and threatening the health of our residents. At present, the use of surgical methods to construct temporary or permanent enterostomy is one of the important methods for clinical treatment of colorectal cancer [2]. Similar to the scale of about 1.7 million enterostomy patients in European and American countries, the total number of enterostomy patients in China has also exceeded 1 million, and is growing at a rate of 100,000 per year [3]. Although enterostomy is an important means to relieve symptoms and prolong life, postoperative complications cannot be ignored. Patients not only have to deal with the complications of the stoma itself, but also are often plagued by skin problems around the stoma. Among them, moisture-related skin injury around the stoma is one of the most common types of complications due to its high incidence. According to the relevant literature [4], the incidence of moisture-related skin injury around the stoma in China is 33.3 %. The occurrence of moisture-related skin injury around the stoma not only damages the skin, but also increases the difficulty of nursing, aggravates the economic burden, and seriously damages the physical and mental health and quality of life of patients. Therefore, it is of great clinical significance to protect the skin around the stoma and carry out effective intervention. Therefore, the intervention measures of dampness-related skin injury around enterostomy are reviewed as follows.

2. Overview of Moisture-related Skin Damage Around the Stoma

Moisture-related skin injury around the stoma is a kind of skin damage caused by the long-term infiltration of wet substances such as feces, sweat or wound exudate around the stoma. Its pathological features are localized epidermal exfoliation that begins at the junction of the stoma and the skin and extends outwards of no more than 4 inches, and can involve the dermis in severe cases. [5]. Clinical manifestations [6]: The patient complained of local itching, pain or burning sensation. The examination showed that the skin impregnated with feces had irregular damage, such as blisters, erythema, epidermal

exfoliation or erosion, and often had serous exudation. Due to uneven skin and exudate, the chassis is not firmly pasted, resulting in frequent shedding of ostomy bags. When replaced, fecal contamination can be seen on the adhesive surface of the removed chassis at the position corresponding to the skin lesion.

3. The Status of Moisture-related Skin Injury Around Enterostomy

In recent years, with the increasing number of enterostomy patients in China, the complications and nursing after enterostomy have gradually attracted the attention of many nursing experts and scholars across the country. The incidence of moisture-related skin injury around the stoma is significantly different in different studies. The incidence reported by foreign studies [7] is as high as 86.2%, while the incidence reported by domestic studies [4] is 33.3%. The potential reasons for this difference in morbidity and outcome can be attributed to regional factors, lack of uniformity in diagnostic criteria, and diversity in assessment tools. The research on moisture-related skin injury around the stoma started earlier in foreign countries. Independent chapters have been set up in the relevant guidelines, which systematically cover assessment monitoring, prevention, skin care and health education. Domestic research on moisture-related skin damage has also progressed. In 2013, after Li Huijuan et al. [8] systematically reviewed the problem. In January 2020, the Chinese Nursing Association officially released the group standard T/CNAS 07-2019 "Adult Enterostomy Care"[9]. This standard clearly classifies the skin damage around the stoma into three types: moist correlation, allergy and mechanical. Dong Shan et al. [10] systematically expounded the prevention and management of moisture-related skin damage around the stoma, and emphasized the key role of protection strategies in preventing its occurrence.

4. Influencing Factors of Moisture-related Skin Injury Around Enterostomy

4.1 Individual Factors

The occurrence of moisture-related skin injury around the stoma is closely related to individual factors such as age, nutritional status, disease, and history of radiotherapy and chemotherapy. With the increase of age, the elasticity and

plumpness of the skin decrease, and the older the age, the higher the incidence of skin damage [11]. Malnutrition can lead to impaired skin barrier function and decreased local immune function, thereby increasing the occurrence of skin damage. Qiyang [12] believed that the worse the nutritional status, the more serious the skin damage. Lai Yongming et al. [13] believe that patients with diabetes have multiple organ dysfunction, neuronutritional disorders, and abnormal sympathetic nerve function, which reduces the sensitivity of the skin to pain and itching, and increases the risk of skin damage around the enterostomy. Zhu Xiaxue et al. [14] believe that the risk of moisture-related skin damage around the enterostomy in patients undergoing chemoradiotherapy is twice as high as that in patients without chemoradiotherapy.

4.2 Surgical and Enterostomy Factors

Accurate preoperative enterostomy localization by enterostomy therapists is an important means to prevent and reduce skin complications around the stoma [15]. According to the "adult enterostomy care" [9] group standard, the ideal height of the stoma is 1-2 cm. The occurrence of moisture-related skin injury around the stoma is related to many factors. The study [16] confirmed that the low height of the stoma and the damage to the integrity of the surrounding skin are the risk factors; fecal traits are also a key factor, and the risk of watery stools is significantly higher than that of soft or loose stools [17]. In view of the large amount of ileostomy excrement, watery and rich in digestive enzymes, it has strong irritation to the skin. The study of Liu Yingge et al. [6] therefore believed that compared with patients with colostomy, patients with ileostomy have a higher risk of moisture-related skin damage around the stoma.

4.3 Stoma-related Factors

The rational application of ostomy products is very important to prevent moisture-related skin injury around enterostomy. The use of ostomy bag is an important factor affecting the moisture-related skin injury around the ostomy. The study found that [18], patients who used one-piece and two-piece ostomy bags alternately had a significantly higher risk of moisture-related skin damage around the stoma than those who used a single type. Stoma leakage is the key cause of peripheral skin complications. Leaked excreta produce persistent chemical stimulation and physical impregnation on the skin, eventually leading to damage to the skin barrier. [19] According to a study [20], frequent chassis leakage (> 3 times) is a strong risk factor for moisture-related skin damage around the stoma. Compared with the non-leakage group, the risk ratio of moisture-related skin injury around the stoma was 2.679. The frequency of ostomy bag replacement is also an important factor affecting the skin around the ostomy. Studies have shown that [21] extending the ostomy bag replacement cycle to 3-4 days can be a protective measure (compared to the short cycle of < 3 days). Excessive replacement frequency is easy to cause mechanical damage due to the increase of operation times. If the cycle is too long, the risk of excreta leakage will increase.

4.4 Self-management and Caregivers Related Factors

Mastering the knowledge and skills of stoma self-care is very

important for the postoperative rehabilitation and long-term quality of life of patients with enterostomy [22]. The study pointed out that [23], the lack of self-care ability such as knowledge and skills of enterostomy is a risk factor for stoma complications. The nursing skills of caregivers directly affect the quality of stoma care. Caregivers who lack professional guidance may not be able to properly clean the skin, paste the ostomy bag, or deal with leakage, and cannot meet the needs of out-of-hospital ostomy care [24]. Studies have shown that [25], the risk of moisture-related skin damage around the stoma in patients with replacement caregivers is 4.795 times that of those without replacement.

4.5 Other Factors

Patients with enterostomy often have psychological stress due to changes in physiological structure. Patients with poor psychological status are more likely to ignore skin care, which affects their nursing compliance, thereby increasing the risk of moist-related skin damage around the stoma. Studies have shown that Li et al. [26] conducted a cross-sectional study on 77 patients with stoma and found that skin complications around the stoma were predictors of psychological distress in patients. The study of Qiyang [12] showed that the psychological status of patients with enterostomy was significantly positively correlated with the degree of surrounding skin damage, that is, the higher the psychological status score, the more serious the skin damage. Studies have shown that [27] patients who do not receive telephone follow-up after discharge or do not participate in the stoma fraternity are risk factors for complications in patients with colostomy.

In summary, there are many influencing factors of moisture-related skin injury around enterostomy. Improving the level of knowledge related to stoma care, strengthening self-care of stoma, formulating effective nursing intervention measures, finding problems in time, and combining medical care with family members and patients for effective intervention are the key to improving the physical and mental health and quality of life of patients with enterostomy.

5. Assessment Tool for Moisture-related Skin Injury Around Enterostomy

Accurate and comprehensive assessment is the basis for the prevention and management of moisture-related skin damage around the stoma. Although there is currently no assessment tool specifically for moisture-related skin damage around the stoma, domestic and foreign scholars have developed a variety of tools for assessing skin damage around the stoma. [28] For example, the ostomy skin tool (OST), the ostomy surrounding skin classification tool (CPS), the ostomy care research index (SCORI), and the ostomy-related complication severity index (OCSI). Li et al. [28] considered the scientificity, practicability and applicability of each tool, and believed that OST and SACS tools could be preferred to evaluate the skin state around the stoma in China.

5.1 Peristomal Skin Problem Research Tool (SASC)

The SACS tool [29] was developed by the Italian PSCs research team in 2007 and named by the team to evaluate and

grade skin problems around the stoma. The tool is evaluated from two dimensions: damage type and specific location. One is the severity of the injury (from L1 skin redness to L4 tissue necrosis), and the other is the anatomical location of the injury (divided by the clock quadrant T1-T5). The evaluation results of the tool are presented in a combination of "type / location" (such as L2 / TII), which provides a standardized basis for clinical diagnosis.

5.2 Ostomy Skin Tool (OST)

The scale was studied by scholars such as INEKE C [30], including the DET score and the AIM nursing guide. It can not only quantify the area and severity of skin around the stoma (such as discoloration, erosion, and tissue hyperplasia), but also provide targeted guidance for subsequent assessment, intervention, and monitoring based on the cause of injury. In terms of quantification, the tool calculates the total DET score (0-15 points) by assessing the damage area (0-3 points) and severity (0-2 points), and divides the damage into three levels: light, medium and heavy. In terms of guidance, the tool divides PSCs into four categories based on etiology, such as chemical stimulation and mechanical injury, and provides AIM nursing guidelines for each category, including assessment, intervention and monitoring, to guide clinical practice.

In summary, although the existing assessment tools can improve the efficiency of assessment and promote professional communication, their functions are limited to describing the status of skin, lacking the ability to predict the occurrence of skin problems and early identification of high-risk groups.

6. Comprehensive Management Strategy of Moisture-related Skin Injury Around Enterostomy

6.1 Orifice Positioning

In principle, the location of the ostomy should be selected within the patient's line of sight, avoiding the bone protuberance, the uneven folds and scars of the abdomen, and more importantly, it is necessary to consider whether the patient's posture during daily life activities affects the stability of the ostomy bag paste. Accurately positioned enterostomy helps to improve the patient's self-care ability, enabling them to perform stoma care independently, thereby effectively reducing the incidence of moisture-related skin damage around the stoma [31]. Although the concept of stoma positioning has been widely known and promoted, some hospitals have not fully implemented it. Medical staff should take the initiative to do a good job in preoperative positioning, and improve their professional skills and emergency response ability through standardized training in the hospital, so as to reduce the follow-up problems caused by improper positioning of stoma.

6.2 Evaluation and Cleaning

6.2.1 Evaluation

The group standard of "adult enterostomy care" emphasizes [9] that the stoma should be evaluated daily after operation to find out whether there are abnormalities in the stoma and its surroundings in time. Evaluation content [10]: 1 Intestinal stoma evaluation: location, height, size, shape, discharge characteristics and quantity. 2 The skin around the enterostomy: moist source, skin integrity, hair, abdominal contour, whether there is moisture-related skin injury or other forms of skin injury, as well as the duration of injury, whether there is direct contact with the discharge, whether there is itching and burning sensation. 3 Evaluation of moisture-related skin injury around the stoma: moisture source, injury site, color, degree, range, exudate volume and effectiveness of intervention. 4 Evaluation of the use of enterostomy care products: to evaluate the correct use, daily maintenance and removal methods of the products; evaluate the type of chassis, the size of the opening, the degree of fit, the frequency of replacement, as well as the tightness in different positions and whether there is leakage under the chassis; evaluate whether leakproof and moisture-proof products such as leakproof creams and skin protective films are used. General condition assessment of patients: age, weight, payment method of medical expenses, economic ability, learning ability, visual impairment and other combined diseases. Lifestyle assessment: skin cleaning methods, living conditions, diet, wearing, swimming or hot bath and other activities to increase the source of moisture.

6.2.2 Cleaning

Choose a mild, low-sensitivity, non-irritating solution to clean the skin around the enterostomy from the outside to the inside. Local cleaning can choose warm water and normal saline, and minimize the use of the solution during cleaning [32]. Normal saline or warm water soaked cotton balls / wipes were used to clean the stoma and surrounding skin from outside to inside, and then the skin was dried with dry gauze or soft paper towels [9].

6.3 Reasonable Selection and Use of Nursing Appliances

6.3.1 Make pockets

Choosing suitable stoma appliances according to the type of stoma is the first line of defense to effectively prevent skin problems. The choice of pockets is adjusted with the rehabilitation process: a. transparent, carbon-free open pockets should be selected in the early stage for observation; during the rehabilitation period, opaque bags can be replaced to balance aesthetics and privacy. According to the characteristics of excreta: b. the excreta is thin / watery, it is recommended to use open pockets to facilitate discharge at any time; thick / forming, open pocket or closed pocket can be selected. According to the patient's own ability: c. Visual impairment: transparent pockets are recommended for easy observation. Poor hand flexibility: It is recommended to pre-open pockets, without cutting, easy to operate. According to the shape of abdomen and stoma: d. flat or bulging abdomen: suitable for flat chassis. Stoma retraction: Convex chassis is suitable, and belt fixation is recommended to prevent leakage [9].

6.3.2 Orifice chassis

When pasting the ostomy bag, the size of the enterostomy should be measured by the stoma gauge, and the diameter of the stoma chassis should be larger than the diameter of the enterostomy by 1-2mm [9]. In the early postoperative period, the size of the chassis opening should be dynamically evaluated and adjusted to adapt to the changes in the stoma edema period. The fixed-size chassis can be used until the stoma shape is stable at 4-6 weeks after surgery. [33] The ostomy bag should be used once and must be matched with the ostomy chassis. Patients with high displacement should choose high displacement ostomy bag. Patients with poor vision and inconvenient operation should choose transparent ostomy bag. The stoma chassis is dismantled and used immediately, and it cannot be wetted or heated to increase viscosity [10]. When the stoma chassis is torn off, it cannot be torn off rigidly. The chassis must be fixed with one hand and the stoma chassis must be torn off slowly with one hand. If the adhesive tape around the chassis is not easy to tear off, it can be first fused with baby oil or mineral oil and slowly torn off.

6.3.3 Stoma accessories products

Skin protective agent is a kind of external preparation, which can form a protective barrier on the skin surface, prevent pollutants or bacteria from causing damage to the skin, promote the healing of skin wounds around the stoma, and reduce the occurrence of skin complications around the stoma. Clinically, the commonly used skin protective agents for patients after enterostomy mainly include powder (such as stoma care powder [10]), liquid / film (skin protective film [34]), ointment (such as moist burn ointment [35], zinc oxide ointment [36]) and dressings (such as hydrocolloid dressings, alginate dressings [37]). Stoma leakage prevention products are mainly used to strengthen the adhesion of stoma chassis on the skin, prevent the exudation of pollutants in the bag, and avoid the damage of pollutants to the skin. Direct contact with the skin around the enterostomy includes anti-leakage ring [38], anti-leakage strip and anti-leakage ointment [39].

6.3.4 Stoma replacement and dumping

When the stoma chassis is white or curled, it should be replaced as soon as possible, and it should be carried out on an empty stomach in the morning. When 1/3 ~ 1/2 of the pocket is full, it is advisable to discharge the excreta in the pocket [9].

6.4 Health Education Follow-up

Reasonable perioperative health education and follow-up for patients with stoma by professionally trained stoma therapists, stoma specialist nurses, experienced clinicians and registered dietitians can reduce the incidence of complications, improve the quality of life of patients, and promote their early return to society [40]. Before the operation, the patient was explained the structure and function of the stoma, the fear of the stoma was reduced, and the stoma was positioned with the medical staff. After the operation, the patients were guided to learn and master the replacement of the ostomy bag and the ostomy chassis, the selection and use of the ostomy care products, the skin care and evaluation around the ostomy, the development and prevention of the moist skin injury around the ostomy,

and the lifestyle guidance. Before discharge, it is necessary to evaluate the patient's self-care ability, focusing on whether it can independently evaluate the skin condition of the stoma and correctly demonstrate the nursing process of moist skin injury around the stoma [41]. After discharge, all patients with enterostomy were followed up regularly [43].

7. Summary

The prevention of skin damage around enterostomy is a comprehensive project. Its core lies not only in the basic management of excreta leakage, but also in the construction of a patient-centered comprehensive support system. Provide personalized guidance and services for different patients' mental state and physical condition. Through adequate health education, empower patients and enhance their confidence and skills in self-care; accurately assess the physiological and psychological state of each patient, take predictive intervention measures, and actively identify and avoid risks. Maximize the integrity of the skin around the stoma and improve the overall quality of life of patients.

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