ORIGINAL RESEARCH

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Does the Stoma Site Marking Affect Stoma Quality?

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Abstract

Objective

Ostomy structure is an indispensable part of colorectal surgical procedures. With stoma, surgeons hope to get rid of the morbidity of the anastomosis they made. Ostomies are the source of morbidity both during construction and closure. Problem-free ostomies both reduce healthcare costs and support patients' quality of life. In this study, we aimed to reveal the relationship between the marking performed by the wound, ostomy and continence nurse (WOC nurse) before surgery and the quality of the stoma.

Material and Method

150 patients who underwent surgery for malignant diagnosis in our oncology clinic and needed stoma construction were included in the study. The medical records and database of the patients kept by the WOC nurse were retrospectively reviewed. Demographic and clinicopathological data were recorded and grouped. Patients who underwent both emergency and elective procedures were included in the study. Statistical analyzes were performed within the 95% confidence interval. A p-value of less than 0.05 was considered statistically significant.

Results

A significant relationship was observed between the marking the stoma site and BMI with the complications (p=0.03, p=0,01). Patients with ileostomy were associated with significantly more peristomal skin complications (PSC) than patients with a colostomy (p=0.02). Again, in the different analyses performed, a significant difference was observed between stoma marking status and stoma diameters; large stoma diameters were associated with patients who were not consulted by the WOC nurse (p=0.001).

Conclusion

The findings showed that WOC nurse preoperative consultation was associated with fewer complications affecting stoma quality.

Keywords: Complication, stoma, stoma quality, WOC nurse

Introduction

Stoma construction is a common procedure in colorectal surgery as part of operations for malignant and benign gastrointestinal system diseases. These formations (ileostomy or colostomy) are an integral part of the surgical management of intra-abdominal pathologies in both emergency and elective patients. The underlying basic principle is that feces' flow is directed from the pathology site towards the anterior

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abdominal wall through the end or side intestinal ring. Thus, it is aimed to reduce the morbidity and mortality associated with gastrointestinal diseases through a stoma (1). Therefore, stoma formation is a simple but nontrivial attempt.

The stoma can be thought of as a new organ created to lead a healthy and normal life, rather than just a passage through which feces can be excreted. We should see the ostomy as an anastomosis of the intestinal system to the skin and apply the surgical technique principles here as in anastomoses (2). Despite advances in surgical techniques and stoma care products, stoma complications are still common (3). A complication rate of 21-70% has been reported in various studies. (4). Contact dermatitis and many other peristomal skin problems are the most common complications (5). Inappropriate stoma site, stoma mismanagement, and stoma complications, together with decreased quality of life (6), also cause a significant increase in health costs regardless of ostomy durations (7).

Early and regular follow-up and adequate stoma diameter and height are essential to prevent complications associated with a stoma. Cooperations of surgeons and the wound, ostomy and continence nurse (WOC nurse), providing feedback is extremely vital to improving stoma quality (8).

In this study, we aimed to investigate the relationship between the preoperative marking of the stoma site by the WOC nurse in our oncology clinic with stoma complications, stoma size, and stoma quality.

Material and Method

Following obtaining the local ethics committee approval of Ankara University Faculty of Medicine, the medical records of 156 patients diagnosed with malignant tumors who needed stoma creation at the Oncological Surgery Clinic between January 2016 and December 2020 were collected and retrospectively reviewed. Demographic and clinicopathological data were recorded. Patients who underwent both emergency and elective procedures were included in the study. Six patients were excluded due to missing data. Patients were grouped in terms of gender, age, BMI, diagnosis, urgency, stoma status (type, location, duration), complications, and preoperative marking of the stoma area by our WOC nurse. All data were presented as mean±standard deviation (SD), number, percentage, maximum and minimum values. Afterward, statistical analyzes were made. Parametric test assumptions were reviewed before differential analysis was performed. Normality was checked by the Kolmogorov Smirnov test, skewness, and kurtosis. In the case where the assumptions were provided, the difference analysis was performed using the one-way analysis of variance (ANOVA) and the Kruskal Wallis test when not. Paired comparisons were made using the Mann-Whitney U test. The relationship between categorical variables was analyzed using the chi-square test. Statistical analyzes were performed within the confidence interval of 95%. A p-value of less than 0.05 was considered statistically significant.

Our stoma marking method: Our WOC nurse evaluated patients scheduled for surgery for possible stoma formation one day before or on the day of surgery, according to the recommendations of the Wound Ostomy Continence Nurses Society and the American Society of Colon and Rectal Surgeons. Patients were allowed to lie down, sit, or stand, and markings were made with special rulers to avoid the possible stoma site coinciding with the belt line and any abnormal skin folds (Figure 1). Stoma diameters were recorded by measuring the skin edge and the intestinal mucosa junction line on the postoperative 10th day. Besides, stoma shape, complications, stoma localizations of the patients as the left-upper, left-lower, right-upper, and right-lower quadrants were recorded.

Figure 1
A.Stoma signs in sitting position, B.Stoma signs in standing position, C.Stoma signs in supine position

Results

Of the 150 malignant diagnosed patients included in the study, 53.3% (n=80) were male, and 46.7% (n=70) were female, and the mean age was 58.30±5.03 years (Table 1). BMI of 28 (18.6%) patients was over 25 (Table 2). Demographic and clinicopathological characteristics of the patients are summarized in Table 2. While the rate of patients marked by the WOC nurse before the operation was 51.3% (n=77),

Table 1 Age of patients and the diameter of the stoma

	Mean	SD	Max	Min
Age (years)	58.3	5.0	86	19
Stoma diameter (mm)	38.66	5.6	30	57

Table 2 Demographic and clinicopathological characteristics of the patients

Variables	Number (n)	Percentage (%)
Gender		
Male	80	53.3
Female	70	46.7
Diagnosis		
Rectal cancer	86	57.3
Colon cancer	26	17.3
Other malignancies	38	25.4
Surgery performed		
LAR[1]	59	39.3
APR [2]	14	9.3
Colon resection	77	51.4
Degree of urgency		
Urgent	31	20.7
Planned	119	79.3
Stoma type		
Ileostomy	78	52
Colostomy	72	48
Marking status		
Marked	77	51.3
Unmarked	73	48.7
Stoma site		
Lower left	59	39.3
Upper left	7	4.7
Lower right	76	50.7
Upper right	8	5.3

Table 2 continued Demographic and clinicopathological characteristics of the patients

Variables	Number (n)	Percentage (%)
Stoma duration		
Temporary	105	70
Permanent	45	30
BMI[3]		
>25	28	18.7
<25	122	81.3
Complication status		
No	98	65.3
Related to skin	29	19.3
Mucocutaneous separation	15	10
Retraction	8	5.4

1 Low anterior resection 2 Abdominoperineal resection 3 Body mass index

Table 3 Distribution of complications by stoma site marking condition and BMI

Parameters(N) (N=150)	Marked N=77		Unmarked N=73		BMI>25 N=28		BMI<25 N=122	
	N	%	N	%	N	%	N	%
No complication (98)	59	60	39	40	3	3	95	97
Skin lesions (19)	10	35	19	65	7	24	22	76
Mucocutaneous separation (15)	5	33	10	67	11	73	4	27
Retraction (8)	3	38	5	62	7	87	1	13

Table 4 Statistical significance between complications and variables

	Stoma Type	Stoma Site	Degree of Urgency	BMI*	Marking Status
Complication	p = 0.002	p = 0.52	p = 0.536	p = 0.01	p = 0.03

* Body mass index

the number of patients operated without marking was 48.7% (n=73). 79.3% (n=119) of the operations were planned, 20.7% (n=31) were performed with emergency procedures. The distribution of the operations performed and ostomy sites were summarized in Table 2. Complications were observed in 52 (34.6%) of the patients. The distribution of complications by stoma site marking status and BMI are presented in Table 3.

A significant relationship was observed in the analysis performed between the marking of the stoma site, BMI and complications (p=0.03, p=0.01) (Table 4). Significantly fewer complications were observed in patients for whom marking was performed and with a BMI of <25. This significant relationship was not observed between stoma type, stoma site, the case's urgency, and complications (p>.05). However, patients with ileostomy were associated with significantly more skin complications than patients with a colostomy (p=0.02). Again, in the different analyses performed, a significant change was observed between stoma marking status and stoma diameter (p=0.001). This change was also observed between patients who developed complications and stoma diameter (p = 0.015). Stoma diameters of patients who underwent marking and those without complications were significantly smaller than those without.

Discussion

Our study aimed to examine the relationship between stoma site marking performed by a WOC nurse before surgery and stoma quality. Stoma complications were less, and stoma diameters were smaller in patients for whom marking was performed. Stoma quality is closely related to the rarity of complications and small stoma diameters. Especially stoma adapter incompatibility causes skin irritation and increased peristomal skin problems with leakage (4). In our study, the diameter of the stoma with complications was more extensive than those without complications. Drawing attention to this relationship, Pilgrim et al. concluded a 10% increase in the risk of developing parastomal hernia with each mm diameter increase (9). In their meta-analysis, Hsu et al. found that in patients with stoma site marking, marking was associated with a reduction in stoma and peristomal complications in all types of the stoma (10). Although Bass et al. confirmed similar results, they also stated that stoma care training reduces the adverse outcomes (11). Preoperative stoma site marking has a highly protective role in reducing the complication rate and improving the quality of life of patients (12).

As a result, preoperative consultation and marking by a WOC nurse improves stoma quality and reduces postoperative morbidity (4).

Although a complication rate of 21-70% has been reported in various studies, Cottom et al. identified 34% of ostomies as problematic in a database-based study of 93 hospitals enrolling 3970 stoma patients; they reported different complications rates of 6-96%. Stoma height, stoma type, and gender of the patient were identified as significant risk factors, and they reported that BMI did not affect results, but there was a high probability relationship between urgency and a problematic stoma (13). In our study, the complication rate was 34.6%, and the most common complications we encountered were peristomal skin complications (PSC) at rates similar to the literature. Especially PSC was more common in the group with an ileostomy. Although we found a relationship between BMI and a problematic stoma in our study, we could not find the association of the emergency procedure performed to the patient in this relationship. Persson et al. reported PSC as the most common complication; although the PSC rate varied depending on the type of ileostomy, it was encountered as the most common in the ileostomy stoma group at a rate of 60-73% (Persson et al., 2010). Evidence suggests the development of bag leakage as a common problem for patients with a poor-quality stoma and the associated peristomal skin irritation that can adversely affect the quality of life (14).

Stoma creation is full of complications and should not be seen as a minor intervention. They significantly change the patients' lifestyles by creating severe complications that require urgent reoperation and minor problems that expose the patient to day and night distress (15). Stoma diameter decreases significantly during the first two weeks after hospital discharge, and the physical configuration of the stoma improves during this time (16). Most early complications are also observed during this period.

Studies continue to identify conditions to minimize stoma complications and associated morbidity and achieve a common consensus. Thanks to the formation of consensus (Delphi Consensus), which includes application guidelines on care and follow-up instructions to be applied to patients, it has become easier for WOC nurses to identify the factors that play an essential role in evaluating body and stoma profiles to determine the best pouching system (14).

Conclusion

The dramatic change in complications from the center to center indicates that surgical technique and stoma care are critical factors in stoma complications. WOC nurses must take a more active role in stoma treatment with surgeons, and preoperative consultations are essential in colorectal surgery clinics. Prospective, randomized controlled studies are needed to understand the more common risk factors better.

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Conflict of Interest Statement
The authors have no conflicts of interest to declare.

Ethical Approval
The study was conducted in accordance with the Declaration of Helsinki, and approved by the Ethics Committee (Date: 14.01.2021, Decision No: İ10-627-20) for studies involving humans.

Consent to Participate and Publish
Informed consent form was not required because of retrospective designed study.

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Availability of Data and Materials
Data available on request from the authors.

Authors Contributions
SİB: Conceptualization; Formal analysis; Investigation; Methodology; Validation; Visualization; Writing-original draft.

ŞD: Conceptualization; Data curation; Formal analysis; Methodology; Validation; Visualization; Writing-original draft.

MAÇ: Data curation; Investigation; Methodology; Writing-original draft.

FA: Data curation; Investigation; Methodology; Validation; Visualization; Writing-original draft.

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Periodontal Health and Salivary Thiol-Disulphide Homeostasis in Multiple Sclerosis Patients

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Abstract

Objective
Multiple sclerosis (MS) is a chronic autoimmune disease in which neuroinflammation and oxidative stress play important roles in its pathology. Thiol-disulphide homeostasis is considered a marker of oxidative stress and shown to be affected in several disorders including MS. The aim of this study was to compare salivary disulfide and thiol levels in MS patients with systemically healthy controls and to evaluate whether periodontal status had an effect on thiol-disulfide homeostasis in saliva.

Material and Method
This descriptive study included a total of 184 volunteers, 92 with MS and 92 systemically healthy volunteers. Each person underwent medical, neurological and oral examinations. In saliva samples, native thiol (NT), total thiol (TT), disulphide levels were measured. The ratios of NT/TT, disulphide/NT, D/TT were calculated and compared between the patient and control groups.

Results
There was not any difference in the periodontal parameters between the MS and healthy volunteers ($p>0.05$), however, the biomarkers of thiol-disulphide homeostasis in saliva were significantly different between the groups ($p<0.002$), except for TT. When grouped according to periodontal status, although salivary parameters did not differ in both the MS and control groups ($p>0.05$), MS patients showed decreased NT/TT and increased disulphide/NT ratios compared to the healthy volunteers ($p<0.05$).

Conclusion
Our results have shown that salivary thiol-disulphide balance was shifted to the oxidative side in MS patients.

Keywords: Disulphide, multiple sclerosis, periodontitis, saliva, thiol

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