ORIGINAL CONTRIBUTION

The Impact of Preoperative Stoma Site Marking on the Incidence of Complications, Quality of Life, and Patient's Independence

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BACKGROUND: Preoperative stoma site marking and counseling aim to improve patients' rehabilitation and adaptation to a new medical condition. Objective studies are needed to provide evidence of the impact of care by stoma therapists. Key quality indicators include patients' quality of life, independence, and complication rates as affected by the variable modes of stoma site marking and planning.

OBJECTIVE: The aim of this study was to evaluate the impact of preoperative stoma site marking on patients' quality of life, independence, and complication rates.

DESIGN: A validated stoma quality-of-life questionnaire was used as the main assessment tool. Complications were noted on regular postoperative visits.

SETTING: This is a single-center, clinical study. The study was conducted at the Rambam Health Care Campus in Haifa, Israel. Rambam Health Care Campus is a tertiary university hospital.

PATIENTS: All patients who underwent an elective stoma creation between 2006 and 2008 were included.

MAIN OUTCOME MEASURES: Evaluated parameters included demographics, stoma type, marking status, complication rates, quality of life, and independence parameters.

RESULTS: One hundred five patients (60 men and 45 women) were included, of whom 52 (49.5%) were preoperatively marked and 53 (50.5%) were not marked. Sixty stomas (57%) were permanent, and 45 (43%) stomas were temporary. The quality of life of patients whose stoma sites were preoperatively marked was significantly better than that of the unmarked patients ($p < 0.05$ in 18 of 20 items), their independence parameters were significantly better, and their complication rates significantly lower. All of these results were significant irrespective of the stoma type.

CONCLUSIONS: Preoperative stoma site marking is crucial for improving patients' postoperative quality of life, promoting their independence, and reducing the rates of postoperative complications. The role of the enterostomal therapist is very important in the ostomates' pre- and postoperative care.

KEY WORDS: Stoma site marking; Quality of life.

It is widely accepted that preoperative counseling for patients who are undergoing elective formation of a stoma can relieve patients' fears and help with postoperative adaptation.[1] Marking the site for a stoma preoperatively allows the abdomen to be assessed in laying, sitting, and standing positions, thus determining the optimal future site. Such preparation can help reduce postoperative problems such as leakage, fitting challenges, need for expensive custom pouches, skin irritation, pain, and clothing concerns. Suboptimal placements may result in unnecessary complications and may negatively impact psychological and emotional health, whereas good placement enhances the likelihood of patient independence in stoma care and resumption of normal activities.[2–6] Several studies reported a reduction in postoperative stoma-related

Funding/Support: The statistical analysis performed in this study was financially supported by Coloplast, Israel.

Financial Disclosures: None reported.

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Dis Colon Rectum 2012; 55: 783–787
DOI: 10.1097/DCR.0b013e31825763f0

complications in patients who underwent preoperative stoma site marking and education,[4,7–9] and the relevant literature emphasizes the important role that enterostomal therapists have in the treatment of ostomates.[10–13]

The purpose of this study was to evaluate how preoperative marking of the stoma site and education by an enterostomal therapist influence patients' quality of life (QOL), whether they improve patients' independence, and what is their effect on the rates of postoperative complications.

PATIENTS AND METHODS

Following approval of the institutional ethics committee, an analysis of all adult patients who underwent an elective stoma creation (colostomy, ileostomy, and urostomy) between January 2006 and December 2008 was undertaken. Patients who underwent an emergency operation were excluded. A structured, validated questionnaire consisting of 20 questions was used to assess patients' QOL, the Stoma QOL[14]; additional statements from the longer version of the same questionnaire were used to assess self-confidence and independence parameters. The occurrence of postoperative complications was noted during regular outpatient follow-up encounters. Patients who completed the questionnaire after their temporary stomas were reversed were excluded from the analysis. Variables that were analyzed as parameters for this study included demographics, type of stoma (permanent or temporary) , and whether the stoma site was preoperatively marked. All the patients received the same postoperative care by a single enterostomal therapist regardless of whether their stoma site was preoperatively marked. Additional evaluated parameters were stoma- and equipment-related complications (leakage, fitting problems, peristomal skin problems, parastomal hernia, and prolapse), patients' QOL, and independence measures. The groups of patients were initially compared with regard to the type of stoma (permanent or temporary), and a second comparison was made with regard to preoperative site marking. Statistical analysis was performed by using the χ^2 test with a p value of less than 0.05 considered significant.

RESULTS

The study group included 105 patients. Median age was 65 (21–91) years. Nearly 80% of the patients were older than 50 years of age, and almost 30% were over age 70. Sixty patients (57%) were men, and 45 (43%) were women. There were 49 patients with colostomies, 47 patients with ileostomies, and 9 patients with urostomies. Nearly 50% of all stoma sites were preoperatively marked by an enterostomal therapist. Sixty stomas (57%) were permanent, and 45 (43%) stomas were temporary. The types of stomas (temporary or permanent) and preoperative marking status are summarized in Table 1, and demographic parameters are outlined in Table 2.

TABLE 1. Stoma characteristics

Marking	*Marked 52 (49.5)*		*Not marked 53 (50.5)*	
Stoma type n (%)	Permanent 31 (29.5)	Temporary 21 (20)	Permanent 29 (27.6)	Temporary 24 (22.9)

In most cases, the stoma care was provided mostly by the patients' spouses (49.5%) followed by care given by the patients' offspring (25.7%) or self-care (15.2%), and, in the few remaining cases, the stoma care was provided by other caregivers. Despite that significantly more colostomies were permanent (63.3%) and more ileostomies were temporary (75.6%) ($p < 0.01$ for both), there were no statistically significant differences in rates of site markings between them ($p > 0.1$ for both). Conversely, most urostomies were permanent (90%), most of which were preoperatively marked.

With the use of the validated QOL questionnaire,[14] the patients' QOL was evaluated with regard to preoperative site marking and type of stoma (Table 3). In 18 of 20 parameters, the QOL of patients whose stoma site was marked was significantly better, and in almost all instances there were no differences in the QOL of patients with a temporary or a permanent stoma. Patients' independence in caring for their stomas is outlined in Table 4. Patients whose stoma sites were marked expressed significantly higher confidence and independence. The occurrence of various complications was significantly less frequent in patients whose stoma sites were marked (Table 5). When the patients were divided into 4 groups according to the stoma type and marking type (permanent/temporary, marked unmarked) as in Table 1, the QOL and patients' independence were significantly better, and the rates of complications significantly lower in patients whose stoma site was preoperatively marked regardless of the type of stoma.

TABLE 2. Demographics

		n	*%*
Age, y	18–30	8	7.6
	31–40	5	4.8
	41–50	9	8.6
	51–60	28	26.7
	61–70	25	23.8
	> 70	30	28.6
Sex	Male	60	57
	Female	45	43
Marital status	Single	9	8.6
	Married	71	67.6
	Widowed	15	14.3
	Divorced	9	8.6
	N/A	1	0.9

N/A = not available.

TABLE 3. QOL related to preoperative site marking and stoma type

Item text	Stoma site marked[a]		p	Stoma type[a]		p
	No, %	Yes, %		Temp., %	Perm., %	
I become anxious when the pouch is full	54.7	13.5	<0.01	37.8	31.7	NS
I worry that the pouch will loosen	66.0	26.9	<0.01	48.9	45	NS
I feel the need to know where the nearest toilet is	79.2	71.2	NS	75.6	75	NS
I worry that the pouch may smell	67.9	25.0	<0.01	44.4	48.3	NS
I worry about noises from the stoma	52.8	13.5	<0.01	33.3	33.3	NS
I need to rest during the day	32.1	34.6	NS	31.1	35	NS
My stoma pouch limits the choice of clothes that I can wear	52.8	26.9	<0.01	46.7	35	NS
I feel tired during the day	39.6	17.3	<0.05	22.2	33.3	NS
My stoma makes me feel sexually unattractive	45.3	19.2	<0.01	40	26.7	NS
I sleep badly during the night	32.1	13.5	<0.05	28.1	18.3	NS
I worry that the pouch rustles	41.5	3.8	<0.01	17.8	26.7	NS
I feel embarrassed about my body because of my stoma	47.2	17.3	<0.01	40	26.7	NS
It would be difficult for me to stay away from home overnight	73.6	38.5	<0.01	64.4	50	NS
It is difficult to hide the fact that I wear a pouch	35.8	11.5	<0.01	33.3	16.7	0.05
I worry that my condition is a burden to people close to me	32.1	9.6	<0.01	17.8	23.3	NS
I avoid close physical contact with my friends	18.9	3.8	<0.05	11.1	11.7	NS
My stoma makes it difficult for me to be with other people	20.8	5.8	<0.05	13.3	13.3	NS
I am afraid of meeting new people	30.2	3.8	<0.01	20	15	NS
I feel lonely even when I am with other people	18.9	3.8	<0.05	13.3	10	NS
I worry that my family feels awkward around me	17.0	0.0	<0.01	11.1	6.7	NS

QOL = quality of life; Temp. = temporary; Perm. = permanent; NS = not significant.
[a]Percentages are rates of a *positive* reply to the text item.

DISCUSSION

The current study found that preoperative stoma site marking results in significantly better QOL, improved patients' confidence and independence, and lower rates of postoperative complications, irrespective of the type of stoma. Smith et al[15] reported that patients who had permanent stomas had better QOL than patients whose stomas were temporary, suggesting that adjustment to a permanent disability is easier and faster, despite the fact that, objectively, the patient's medical situation was worse. This study used a validated stoma-QOL questionnaire suggesting that such a difference does not exist. The main reason for the differences in the QOL of the different groups was not the type of stoma but whether or not its site was preoperatively marked as an independent factor. Silva et al[16] compared 22 patients with a temporary ileostomy with 16 patients with a temporary colostomy and found that there were no significant differences in the QOL between the 2 groups. The authors did not mention whether or not the stoma sites were marked. Gooszen et al[17] assessed the QOL of 37 patients with temporary loop ileostomies and 39 patients with temporary loop colostomies and found that there were no significant differences between the 2 groups. These results support the findings of the present study that there are no differences in the QOL of patients with colostomies or ileostomies.

In a study by Bass et al[4] the outcomes of 292 patients whose stoma sites were marked were compared with 301 patients whose stomas were not marked. The authors reported that the overall complication rates in the marked and the unmarked groups were 32.5% and 43.5% ($p < 0.0075$), with significantly more early postoperative complications occurring in the unmarked patients, and no differences were found in the rates of late complications. Most of the

TABLE 4. Patients' independence related to preoperative site marking

Item text	Stoma site marked[a]		p
	No, %	Yes, %	
Do you care for your stoma yourself?	77.4	90.4	NS
Do you need help caring for your stoma from family or friends?	79.2	48.1	<0.01
Do you require frequent changes of the base plate?	98.1	55.8	<0.01
Does changing the base plate take a long time?	77.4	36.5	<0.01
Was postoperative appliance fitting difficult?	15.1	3.8	<0.05
Was it difficult to adjust to living with a stoma?	32.1	7.7	<0.01
Do you feel confident caring for your stoma?	90.6	98.1	NS

NS = not significant.
[a]Percentages are rates of a *positive* reply to the text item.

TABLE 5. Stoma-related complications

Item text	Stoma site marked[a]		
	No, %	Yes, %	p
Did your appliance often leak in the first month after the operation?	79.2	39.5	<0.01
Does your appliance often leak now?	35.8	9.8	<0.01
Did you have frequent fitting problems in the first month after the operation?	67.9	21.2	<0.01
Do you have fitting difficulties now?	23.5	4.0	<0.01
Do you have parastomal skin irritation?	75.5	38.5	<0.01
Do you have a parastomal hernia?	24.5	3.8	<0.01
Did you have a parastomal hernia repair operation?	11.3	1.9	NS
Did you have other operations because of parastomal or stoma-related complications?	18.9	1.9	<0.01
Do you have a stomal prolapse?	7.5	0.0	<0.05
Did you require frequent professional consultations because of stoma-related problems?	66.0	17.3	<0.01

NS = not significant.
[a]Percentages are rates of a *positive* reply to the text item.

early complications in the unmarked patients were attributed to poorly placed stomas causing various skin- and equipment-related problems. Bass et al did not evaluate the QOL of the patients in their cohort.

Karadağ et al[13] evaluated the effect of postoperative stoma therapy on patients' QOL. Forty-three patients with permanent colostomies and ileostomies were included in their study; none of the patients had preoperative stoma counseling or site marking. The authors used The Digestive Disease QOL questionnaire 15 as the evaluation tool and showed that the QOL after stoma counseling was significantly better than before counseling. These results suggest that postoperative stoma counseling is crucial for improving patients' QOL even if the patients' stoma sites were not marked.

Williams[18] review of stoma care emphasized the truth in the proverb: "A problem shared is a problem halved." By proactively listening to the fears and the problems of patients about to have stomas, many of the worries are allayed, and distressing questions were resolved.

In our study, we included patients with all kinds of stomas (temporary/permanent, ileostomy, colostomy, and urostomy) who had an elective operation and were regularly followed up by an enterostomal therapist and colorectal and general surgeons. The patients with temporary stomas participated in the study and filled out the questionnaires while their stomas were still in place.

The key conclusions are that the patients whose stoma sites were preoperatively marked had significantly better QOL and significantly fewer postoperative complications, and these results are irrespective of the stoma type (permanent or temporary). Consequently, it is our current practice, and recommended to all, to include the enterostomal therapist in the preoperative evaluation and assessment of all future ostomates, and to refer these patients for regular postoperative stoma counseling.

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