
INTESTINAL STOMAS AND THEIR COMPLICATIONS: A DESCRIPTIVE STUDY

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Summary

A retrospective review of 80 consecutive patients with different types of intestinal stomas was carried out to analyze the indications, complications and the complication rate with respect to stoma type. The most common type of stoma was found to be end sigmoid colostomy (35%) followed by transverse loop colostomy (22.5%). The most common indication for stoma construction was colorectal cancer (37.5%) followed by Hirschsprung's disease and imperforate anus (12.5% for each). A total of 64 complications were reported in 49 patients for a corrected complication rate of (61.25%). Peristomal skin excoriation was the most frequently recognized complication in this study (45.3%), followed by prolapse (23.4%) which was almost exclusive to infants and children. Transverse loop colostomy was associated with the highest complication rate (72.2%) followed by end sigmoid colostomy (64.28%). End ileostomy was associated with the lowest complication rate (33.3%) of all types of stoma. Emergency stomas and stomas in children were found to be associated with higher complication rates. The morbidity of stoma seems to be related to insufficient preoperative planning, technical errors of stoma construction and poor stoma care and management.

Introduction

Intestinal stomas are used in surgical management of a number of congenital and acquired gastrointestinal conditions¹. They are widely used in the treatment of colorectal diseases since they are relatively easy to construct and are supposed to increase the safety of colorectal surgery².

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Intestinal stomas remain required in many operations for inflammatory bowel diseases, for colorectal tumours, trauma, diverticulitis and other conditions³.

Each type of stoma is associated with a particular spectrum of complications, but some problems are common for all. Appropriate preoperative assessment and adherence to accepted construction techniques usually will avoid stomal complications⁵.

The number of permanent stomas constructed has fallen considerably,

while at the same time, there has been a shift away from temporary stomas⁶.

Improved preoperative assessment and counselling and longer follow up by the stoma department would be helpful in the management of patients with stomas and would probably contribute to improvement in the quality of life of these patients⁷.

The aim of the study was to describe the state of stoma and surgery in locality of Basrah in terms of types, indications and types and rate of complications and to compare it with the results of other studies.

Patients and Methods

This is a retrospective study conducted in Saddam Teaching Hospital in Basrah between October 2000 and January 2002. The study had involved 80 patients with intestinal stomas of different types, constructed for different indications by surgeons of variable experience.

Some of the patients had already been registered in the Stoma Care Unit, others were registered during the period of the study and their follow up started from the early postoperative period and onwards.

All patients were followed up thoroughly by full history taking and careful physical examination with regard to stoma indication, location, care, appliances and complications. This follow up also included information taken from the discharge summary cards, from the inpatient clinical records and records of Stoma Care Unit. No laboratory or imaging tests were used in this study.

During the period of the study, each patient was seen at least once monthly in the Stoma Care Unit where the stoma appliances had been provided at the same time.

Analysis of these data was done with respect to stoma types, indications and complications and the results were

discussed in comparison with the related studies on intestinal stomas and the current care and management.

Results

The total number of patients involved in the study was 80 (50 males and 30 females). Their ages ranged from 2 days to 80 years, with a mean of 42.5 years. The patients were distributed according to their ages as in Table I. The number of children (below 20 years) were 20 patients (25% of the total), 10 of them were within the first year of life. In 10 of these children (5 male and 5 females), the diagnosis was Hirschsprung's disease, while in the others the diagnosis was imperforate anus (6 males and 4 females).

Table No. I. Age distribution of patients with stoma.

Age (years)	<20	20-40	40-60	60-80	>80
No. of patients	20	13	31	15	1
%	25	16.25	32.75	18.75	1.25

Various types of stomas were represented in this study and their distribution is listed in Table II.

Table No. II. Distribution of different types of stoma

Stoma Type	No.	% of total
End sigmoid colostomy	28	35
Transverse loop colostomy	18	22.5
End colostomy with mucous fistula	11	13.75
Ileal conduit	7	8.75
Sigmoid loop colostomy	5	6.25
Loop ileostomy	5	6.25
End ileostomy	3	3.75
End ileostomy with mucous fistula	3	3.75
Total	80	100%

These stomas were constructed for different indications which are listed with their frequencies in Table III.

Table III. Indications for stoma construction.

Indication	Freq- uency	%
Colorectal cancer	30	37.5
Imperforate anus	10	12.5
Hirschsprung's disease	10	12.5
Perineal injury	7	8.75
Urinary diversion	7	8.75
Ulcerative colitis	5	6.25
Large bowel fistula	5	6.25
Penetrating bowel injury	3	3.75
Sigmoid volvulus	1	1.25
Pseudoobstruction	1	1.25
Diverticular disease	1	1.25
Total	80	100

A total of 64 complications were recorded in 49 of the 80 consecutive patients involved in the study. This resulted in a total complication rate of 80% (64/80). Since 12 patients had more than one complication, the actual percentage of patients with complications was 61.25% (49/80). The frequency of each type of stoma complication is presented in Table IV.

Table IV. Frequency and percentage of each stoma complication.

Complication	No.	%
Peristomal skin excoriation	29	45.3
Prolapse	15	23.4
Bleeding	6	9.44
parastomal infection (stitch abscess)	5	7.8
Diarrhoea	3	4.7
Retraction	2	3.12
Stenosis	2	3.12
Parastomal hernia	1	1.56
Necrosis	1	1.56
Total	64	100

A detailed breakdown of the complication rate according to stoma type can be found in Table V. In 37 patients, the stomas were constructed as part of an emergency surgery, while in the rest 43 patients, the stoma was part of an elective surgery.

Neither emergency nor elective stomas were marked preoperatively

Seventy three percent (27/37) of emergency stomas were associated with complications in comparison with 51% (22/43) of elective stomas. Table VI.

Stoma care was carried out totally by the patients or their parents, in case of children, without help from a special nurse or a stoma therapist.

Table No. V. Complication rate according to stoma type.

Stoma type	No. with complication/ No. of patients	%
Transverse loop colostomy	13/18	72.2
End ileostomy with mucous fistula	2/3	66.6
End sigmoid colostomy	18/28	64.28
Loop ileostomy	3/5	60
End colostomy with mucous fistula	6/11	54.54
Ileal conduit	4/7	51.1
Loop sigmoid colostomy	2/5	40
End ileostomy	1/3	33.3
Total	49/80	61.25

Table No. VI. Complication rates in emergency and elective stomas

Stoma type	No.	No. with complication	%
Emergency stoma	37	27	73
Elective stoma	43	22	51

Discussion

In a review conducted by the United Ostomy Association (UOA), a high incidence of stoma construction was found to occur in 2 peaks, one between 20-40 years due to ileostomies constructed for treatment of inflammatory bowel diseases (IBD) and the second between 60-80 years owing to colostomies constructed in the treatment of colorectal cancers^{4,8}.

In our study, 2 peaks of stoma incidence have also been found. The largest peak (38.72%) represented patients between 40-60 years of age and was due mainly to the high incidence of colorectal cancer in this age group. This means that a younger age group is affected by colorectal cancer and usually with subsequent construction of a permanent stoma. The second peak of stoma construction was found in patient below 20 years of age which not only reflects the large number of stomas constructed for treatment of congenital colorectal disorders in this age group (Hirschsprung's disease and imperforate anus), but also the accumulation of cases as a result of the delay in doing the definitive surgery and reversal of stoma in those children.

In contrast to the UOA review, the number of stomas in patients between 20-40 years did not represent a peak because IBD are relatively rare in our country as a part of eastern population⁹.

When patients were classified according to their stoma type, we found that the most common type of stoma was end sigmoid colostomy (35%) which was most often a permanent colostomy⁴ constructed as a part of abdomino-perineal resection for treatment of rectal cancer. In the developed countries the use of abdomenoperineal resection for management of rectal cancer is declining which had resulted in lessening the number of permanent colostomies. This is due to the advent in stapling devices and increasing number of rectal cancers

treated by resection and low rectal anastomoses¹⁰.

In other studies, the most common type of stoma was found to be transverse loop colostomy (TLC)¹¹⁻¹⁵. In our study, transverse loop colostomy represented the second most common type of stoma (22.5%) which was due mainly to infants and children for whom TLCs were constructed as temporary diverting stomas for treatment of congenital colorectal disorders. The delay in reversal of these stomas also had resulted in an increase in the number of this type of colostomy (50% of children were above 1 year of age). Pearl et al had found that TLCs were almost constructed twice as frequently as any other type of stoma and this was explained by the high incidence of emergency operations performed for abdominal trauma and advanced malignant neoplasms¹¹.

The third type of stoma in frequency is end colostomy with mucous fistula (13.75%) which was usually constructed as an emergency diverting stoma for an obstructing colorectal cancer or a complicated diverticular disease. As a temporary diverting stoma, this type is better than TLC because a completely diverting colostomy can be constructed only by complete transection of the colon^{4,15}.

The ileal conduits represented (8.75%) of all stomas and were usually constructed after total cystectomy for urinary bladder cancer. Urinary diversion by jejunal or colonic conduits were not included in our study unlike similar studies in other countries¹¹.

Sigmoid loop colostomy represented (6.25%) of all intestinal stomas which was also constructed as a temporary diverting stoma most often to protect a low rectal anastomosis, or in infants in cases of congenital colorectal disorders. The frequency of this type of stoma indicates that TLC was preferred for diversion in infant and children, a

finding similar to that found by Mollit et al¹³. This was in spite of its higher complication rate¹³. Both types of ileostomy (loop and end) represented small proportion of stomas included in the study (6.25 and 3.75 respectively) which reflect the low incidence of IBD for which these types of stoma are usually constructed⁴.

The most common indication for fashioning a colostomy whether a permanent or temporary is colorectal cancer^{4,15}. In our study, colorectal cancer also represented the most common indication for stoma construction (37.5% of all indications). Hirschsprung's disease and imperforate anus each represented 12.5%, while in another study on colostomy in children¹³, Hirschsprung's disease represented about twice the frequency of imperforate anus as an indication for colostomy. Urinary diversion as an indication for stoma (ileal conduit) was found in 7 patients (8.75%) and was mostly due to cancer of urinary bladder. Urinary diversion had resulted in a higher proportion of stoma (conduits) in other studies¹¹ due to the aggressive approach by the surgical services to malignant pelvic neoplasms.

A relatively high incidence of perineal injuries were found in the study (8.75%) which may be explained by the large number of war injuries. IBD (namely ulcerative colitis) was the indication for stoma in 5 patients (6.25%), while in the UOA data, IBD (both ulcerative colitis and Crohn's disease) were the main indication for stoma construction. This finding again reflects the low incidence of IBD in our country in comparison with western population^{9,4}.

Bowel fistula or leaking anastomosis was the indication of stoma in 5 patients (6.25%) and penetrating bowel injury in 3 patients (3.75%), a figure which is lower than the expected because there were a lot of war injuries during the last two decades.

Other indications, which were reported,

were sigmoid volvulus, diverticular disease and pseudoobstruction, one patient for each (1.25%), while in other studies⁵ higher figures had been found.

The total number of complications was 64 and was found in 49 patients. Some of the patients had more than one complication. The overall complication rate was 61.25% which is higher than that reported by other studies^{11-14,16}.

The most common type of stoma complications was peristomal skin excoriation which represented 45.25% of all complications. This is also higher than that reported by other studies^{11,13,17}. The incidence of peristomal skin irritation can probably be minimized by careful preoperative stoma planning by the surgeon¹¹.

The high percentage of TLC especially in children is another contributing factor for skin problems because TLC is associated with difficulty in fitting stoma appliances and its effluent is invariably loose leading to skin excoriation⁷.

The second most common complication was prolapse which was reported in 15 patients and represented (23.4%) of the total number of complications. All patients with this type of complication were children having TLC. There is tendency of TLC to prolapse^{4,7,10} and this association was also observed by other studies¹³ on stoma complications.

The third most frequent complication was bleeding (9.44%) which was most often minor bleeding from the bowel mucosa because the exposed mucosa is prone to repeated trauma by stoma appliances⁴. A high incidence of prolapse which predispose to bleeding from stoma¹ and management without the use of appliances in children had also contributed to this type of complication.

Lower incidence of bleeding had been reported by other studies^{11,13}.

Parastomal infection or stitch abscess represented 7.8% of all complications in our study, while others had reported higher rates of this type of complication^{11,15}.

Retraction of stoma was reported in 2 patients (3.12%). In other reports, the incidence ranged from 1%-6%^{12,13,19,20}, while Pearl et al¹¹ had reported an incidence of stomal retraction up to 13.2%.

Stenosis was also found in 2 patients only (3.12%). Higher incidence had been reported by other studies^{11,13,22}.

Stomal necrosis was found in one patient (1.56%) which was simple and superficial and needed only simple debridement. Higher incidence was reported by other studies, ranging between 2.3% and 17%^{13,15,19,22,23}.

Parastomal hernia was reported in one patient only (1.56% of total complication). Others^{24,25} had reported up to 50% incidence of paracolostomy hernias especially with TLC and up to 28% with ileostomy especially when examined by computed tomography while Pearl et al reported 2.5% incidence of parastomal hernia. C.T. scan may reveal parastomal hernia even when this hernia is impalpable²⁵. So that, the low incidence in our study may underestimate the real incidence of hernia in stoma patients.

Diarrhoea which has represented 4.7% of all complications was mainly found in ileostomy patients. Mild diarrhoea in patients with an ileostomy can result in rapid dehydration and severe electrolyte imbalance and may result from recurrence of IBD, short bowel syndrome or partial obstruction⁷.

The higher complication rate in our study was found to be associated with TLC (72.2%). Although lower complication rates had been reported by others^{13,26}, they had also found that TLC was associated with the highest morbidity.

Sigmoid loop colostomy was associated with 40% complication rate, which is quite lower than that associated with TLC. This finding was reported by others¹³ due to less tendency of sigmoid loop colostomy to prolapse and its effluents are less irritation to the skin. This also supports the conclusion by

Mollitt et al¹³ who recommends the use of sigmoid loop colostomy as a temporary diverting stoma in children whenever possible.

End sigmoid colostomy was associated with 64% rate of complication which was quite higher than that reported by Pearl et al¹¹. Again this high rate of complication is due to high incidence of skin problems associated with these stomas which are usually performed in old patients with low level of stoma care.

End ileostomy with mucous fistula and loop ileostomy were also associated with a high complication rate, 66.6% and 60% respectively. Pearl et al¹¹ also found that this group of patients was associated with the highest complication rate in their series. This high rate of complication may be due to that ileostomy construction is technically demanding and should be planned preoperatively whenever possible²⁷. Babcock et al found that the morbidity of unplanned ileostomies was two to three times greater than that for planned ileostomies²⁸.

End sigmoid colostomy with mucous fistula was associated with 54.54% rate of complications. These stomas were usually constructed on emergency basis for obstructing rectal cancer or diverticular disease and it is well known that emergency stomas are associated with high rate of complications^{11,15,23}.

Ileal conduits were associated with 51.1% rate of complications. Again a high rate is mostly related to skin problems from persistent leakage of urine and technical errors in conduit construction^{11,21}.

The lowest rate of complications was found in relation to end ileostomy group (33.3%). This is in contrast to other studies^{11,27,28}, which had found that end ileostomy was associated with a high morbidity because of the technical demands needed in its construction and the irritant nature of ileostomy effluent which causes more skin excoriation.

For all types of stoma, the complication rate is higher than that which is accepted, because 10-20% morbidity is considered to be average in the surgical community. If we excluded skin excoriation from the complications, the complication rate can be reduced to 25% which mean that stoma morbidity can be reduced significantly by improving the level of stoma care because most of skin problems are the result of improper stoma care and peristomal skin protection¹¹.

A higher morbidity in emergency stomas than elective ones was also found in our study, like other studies^{11,15,23}. Emergency stomas were associated with 73% complication rate compared to 51% rate in elective stomas. This finding may be explained by that 20 out of 37 emergency stomas were performed in infants and children where complications, especially prolapse and skin excoriation, are common^{13,15}.

Lastly, we want to address the high stoma morbidity in children. If only prolapse is considered, it is reported in 15 out of 20, i.e. 75% of all children with stomas, which is severe in some of cases reaching a length of about 25 cm. This finding had also been reported by others^{13,15} who had found that stoma morbidity was inversely related to the patient's age.

Conclusions

1. The most common type of stoma constructed was end sigmoid

- colostomy followed by transverse loop colostomy especially in children.
2. Stomas were mostly indicated for permanent diversion especially in treatment of colorectal cancers, while temporary diverting stomas were mostly indicated in children with congenital colorectal disorders.
3. The most common complication was skin complications which are mainly related to poor stoma care and skin protection followed by prolapse especially in association with TLC.
4. A high stoma morbidity was found especially in association with TLC, end sigmoid colostomy, in emergency stomas and stomas in children.
5. The overall morbidity of stomas seems to be related to the low level of stoma care and nursing offered for this group of patients.

Recommendations

1. Careful preoperative planning and marking of stoma with the appropriate choice of stoma type is an essential part in stoma construction.
2. The level of stoma care need to be improved if stoma morbidity to be reduced.
3. Stoma care nurses and stoma therapists should be contributed to work in conjunction with the surgeon in managing stoma patients.
4. Support groups and ostomy clubs are needed to be instituted.

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