

Construction and Closure of the Transverse Loop Colostomy

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The clinical courses of 211 patients having transverse loop colostomies performed during the years 1969 to 1980 in the Stockholm region were examined to evaluate problems connected with construction and closure. Forty-seven percent of these stomas became permanent. The morbidity rate for colostomy construction and closure seemed to be independent of the operative techniques used, the underlying disease, and the timing of closure. Thus, early closure (within six to eight weeks after construction) did not affect the local complication rate from the stoma. A meticulous surgical technique is of great importance, and stoma construction and closure is therefore not to be considered a minor operative procedure. [Key words: Transversostomy; Surgical procedure]

IN SPITE OF MANY STUDIES, views still differ on which type of transversostomy construction and closure would give the fewest local complications. Even the optimal interval to close the colostomy remains uncertain. This study compares the frequency of local complications following different types of surgical techniques for construction and closure of colostomies and evaluates how the interval between the two procedures affects the complication rate.

Material and Methods

Four hundred patients had colostomies performed at six hospitals in the Stockholm region between 1969 and 1980 (Ersta Hospital, Karolinska Hospital, Nacka Hospital, St. Erik's Hospital, St. Göran's Hospital, Serafimer-Hospital). This study examines 211 of those who had transversostomy incidental to surgery of the left colon. One hundred thirty-one patients had malignancies in the distal bowel, 52 had complications from diverticulosis, nine had postirradiation injuries, and the remaining 28 patients had miscellaneous complications. Patients with fecal fistulas or anastomotic leakage were excluded. The mean age of the 211 patients (87 men, 124 women) was 68.5 years (range, 42 to 96 years). Twenty-eight patients (13.3 percent) died within 30 days of colostomy

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due to primary disease in 19 and cardiopulmonary complications in nine. In 85 patients the stoma became permanent; in the remaining 98 patients the transversostomy was closed.

Patient records were studied to analyze the different surgical techniques used to construct and close the colostomies, and how these related to the frequency of local complications. Even the possible relevance of the interval between construction and closure was examined. The chi-square test was used for evaluation of unpaired differences.

Results

Construction of Transversostomy: In 39 patients (18.4 percent) a primary mucocutaneous suture was carried out. In the remaining 172 patients (81.5 percent) the bowel was sutured to the inner layers of the abdominal wall, or fixated with glass rods or other devices (conventional stoma). Table 1 lists local complications in the two groups with stomas. Due to inadequate clinical records, it has not been possible to evaluate the frequency of infection rate. The most common complication was prolapse. This could not be prevented by making a primary mucocutaneous suture.

Closure of Transversostomy: Early closure (less than two months) was performed in 45 patients and late closure (more than two months) in 53, making a total of 98 patients with a mean interval of 66 days (range, 16 days to 4 years). Patients with carcinoma of the distal bowel generally had their colostomies closed within 90 days, whereas the majority of patients with diverticulitis had closures after 90 days. The frequency of local complications was slightly lower in the early closure group, although the differences were not statistically significant (Table 2). The method of closure varied. Sixty patients had a simple suture before reinsertion into the abdominal cavity, whereas 38 had a more extensive local resection of their colostomy. The method chosen for closure did not

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TABLE 1. Stomal Complications in Construction of Transversostomy; Conventional Stoma, Mucocutaneous Suture in 211 Patients

Type of Complication	CS*		MCS†	
	N	Percent	N	Percent
Retraction of the stoma	1	0.5	1	2.5
Fistula formation	5	2.9		
Prolapse	14	8.1	5	12.8
Parastomal herniation	6	3.4		

*CS = conventional stoma.
†MCS = mucocutaneous suture.

depend on the underlying disease or the time for closure. The local complications after closure did not seem to be related to the method used (Table 3). The average operation length, as noted in 55 patients, could be calculated as 60 minutes for simple suture and 100 minutes for resection. The mean hospital stay was 22.4 days for simple suture and 18.3 days for patients with stomal resection. Closure of the mucocutaneous stoma (19 patients) had a complication rate similar to the conventionally performed stomas (79 patients) (Table 4).

Discussion

Colostomy is often considered a minor operation, and is usually performed by junior surgeons even in emergency situations. Nevertheless, for the patient even an adequately performed temporary colostomy constitutes a distressing handicap.^{1,2}

Most of the patients in the present study were elderly and suffered from carcinoma in the distal bowel or from diverticulitis. Many colostomies, therefore, originally intended as temporary, became permanent of necessity or convenience. Forty-seven percent of the transversostomies were never closed, a figure corresponding well to the 48 percent nonclosures of Winkler and Volpe.² These figures support suggestions of Kirkegaard *et al.*³ and Winkler and Volpe² that an end-bearing colostomy such as the Hartmann pouch might be preferable, as these are likely to cause less discomfort.

TABLE 3. Complication Rate with Different Types of Closure

Type of Complication	Percent		
	Simple Suture (N = 60)	Resection of the Stoma (N = 38)	Total (N = 98)
Wound infection	8.3	13.1	10.2
Fistula formation	8.3	7.9	8.1
Stenosis		2.6	1
Incisional hernia	10	7.9	9.2

TABLE 2. Complication Rate in Early and Late Closures of Transversostomy

Type of Complication	Early Closure (N = 45) Percent	Late Closure (N = 53) Percent
Wound infection	8.8	11.3
Fistula formation	4.4	11.3
Stenosis	2.2	
Incisional hernia	6.6	11.3

Construction of Colostomy: The most common type of colonic stoma in this investigation was the transverse loop colostomy, which had a complication rate similar to that of several previous reports. Mucocutaneous suture, although performed in a minority of patients, facilitates stoma care as well as bandaging.^{4,5} Experience from St. Mark's Hospital in London⁶ shows that with the modified technique for fashioning the stoma, the application of colostomy appliances is facilitated even further. Complications in the present series were not statistically lower than with a conventionally performed stoma.

Closure of Transverse Loop Colostomies: Local complications following colostomy closures are common. In the present investigation they occurred in about 10 percent, and can be compared from the investigations previously published with rates from 2.9 percent⁷ to 37 percent.⁸ Early complications (< 30 days) were wound infection, fistula formation, or both, whereas late complications (> 31 days) were mainly incisional hernias. The frequency of these complications may be related to the method of closure, timing of closure, and skill of the surgeon. However, the method of closure was not reflected in the frequency of complications in the present material, an observation previously recorded by Todd *et al.*⁷

Previously, the optimal time for closure has been investigated thoroughly.^{1,4,8-13} That late closure may reduce the risk of local complications such as fistula formation^{4,10,14} is supported by Forrester and associates mea-

TABLE 4. Mucocutaneous Suture (MCS) vs. Conventionally Performed Stoma (CS); Complication Rate Following Closure of Transversostomy

Type of Complication	MCS (N = 19)		CS (N = 79)	
	Number	Percent	Number	Percent
Wound infection	3	15.7	7	8.8
Fistula formation	1	5.2	7	8.8
Stenosis	1	5.2	—	
Incisional hernia	—		9	11.3

surements of the mucosal-submucosal blood flow.¹⁵ They found decreased blood flow during the first postclosure weeks and, furthermore, found patients with fistula formation to have a subnormal blood flow. In the present material, however, the slightly higher complication rate following late closure, although not statistically significant, would not imply any advantages by postponing the procedure.

Stomal edema often encourages the surgeon to resect instead of to perform a simple suture for closure within the first month.¹⁶ Nevertheless, the proportion of resection remained about equal in both early and late closure in the present material. Hines and Harris¹⁷ suggest that the underlying disease is the most important factor in choosing the optimal time for closure. The interval should be longer for inflammatory bowel diseases than for carcinomas, a principle utilized in the present series. It seems unnecessary, therefore, to delay colostomy closure for the noninflammatory and nonirradiated colon.

Conclusions

Results from the present investigation suggest the following recommendations for construction and closure of transversostomies. A primary mucocutaneous suture facilitates bandaging, but does not seem to prevent local stomal complications. The interval to subsequent stomal closure can be reduced to six to eight weeks without a significant increase in local stomal complications. Resection as opposed to simple closure does not increase the complication rate. The fashioning and closure of transversostomies can be a technically difficult procedure, and ought not to be left to a relatively inexperienced surgeon without supervision.

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Announcement

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