



Early and Late Complications Following Surgery for Rectal Carcinoma: Study of 56 Cases

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ABSTRACT

INTRODUCTION: *Colorectal carcinoma is the most common gastrointestinal malignancy. Mainstay of treatment is surgical excision. Surgical procedures include anterior resection (AR) with or without diversion colostomy (DC), abdominoperineal resection (APR) with end colostomy (EC) and palliative colostomy. All these surgeries are associated with intraoperative as well as postoperative complications. The aims and objectives of the present study were to analyse the complications during early (up to first 2 weeks) and late (>2 weeks and follow-up) postoperative period and complications related to abdominal and perineal incision sites and colostomy.*

MATERIAL & METHODS: *It was a prospective study conducted RNT Medical College from June, 2008 to February, 2011 on 56 patients who had confirmed rectal biopsy of carcinoma rectum and underwent surgery either definitive or palliative. Details regarding operative procedure and early and late complications were noted.*

RESULTS: *Out of 56 patients, 36 were males and 20 were females. Curative resection was done in 26 patients (17 APR & 9 AR). Early complications observed were colostomy related (21.5%), perineal wound related (11.7%), urinary infection (8.9%), abdominal wound related (3.6%) and urinary incontinence in 3.5%. Most common colostomy related complication was peristomal skin irritation. Recurrence during the study period was seen in 6 patients and mortality rate was 14.2%.*

CONCLUSION: *Carcinoma rectum shows male preponderance with no significant difference in complications depending on gender. Early diagnosis of rectal cancer is important to avoid or minimised nature and severity of post operative complications. This is possible only when patients are aware of preventive measures and approached doctors for slightest change in bowel habits.*

KEYWORDS: *Colorectal carcinoma, Early complications, Late complications.*

INTRODUCTION

Colorectal cancer is most common gastrointestinal malignancy. The mainstay of treatment for rectal cancer is surgical excision of the affected segment of bowel together with appropriate tumor-specific mesorectal excision. There are various operative procedures developed for rectal carcinoma, the primary aim of which is eradication of malignancy with preservation of anatomic and physiologic function. The surgical management of rectal cancers depends on a number of factors, including stage, tumor size, location within the rectum, depth of invasion into the wall of the rectum, and involvement of the sphincter complex. Carcinoma of the upper rectum should be treated by resection of upper rectum with colorectal anastomosis is referred to as anterior resection. If resection of rectosigmoid growth is performed above the pelvic peritoneum is called as high anterior resection, whereas when pelvic peritoneum is necessary to open to resect the cancer is called low anterior resection. The Abdominoperineal Resection (APR) is reserved for cancers of the lower rectum where an acceptable distal margin between the tumor and the sphincter complex cannot be obtained.

Operative complications can be divided into intraoperative and postoperative. Major postoperative complications include Infectious complications consist of wound infections, intra-abdominal abscesses, and/or anastomotic leaks. The important risk factors for intra- and postoperative complications in colorectal surgery are age, nutrition status of the patient and experience of the surgeon. Beyond the immediate postoperative risks, patients also risk functional derangements. Sexual and bladder function may also be adversely affected, because of injury to autonomic nerves. Complications of stoma creation remain common, despite extensive measures aimed at reducing them. Commonly seen early postoperative stomal complications include improper stoma site selection, vascular compromise, retraction, peristomal skin irritation, peristomal infection/ abscess/ fistula, acute

parastomal herniation and bowel obstruction. Late complication associated with stomas, along with aforementioned early complication, are stricture/ stenosis, parastomal hernia etc. The aims and objectives of this study were to analyse the complications during early (upto first 2 weeks) and late (>2 weeks and follow-up) postoperative period and complications related to abdominal and perineal incision sites and colostomy.

MATERIAL AND METHODS

This prospective study was conducted at RNT Medical College, Udaipur with the permission of research review board and ethical committee of the hospital. It included all the patients who were operated for rectal carcinoma, whatever procedure would be done, from July, 2008 to February 2011. Patients from both sexes of various age groups who had carcinoma rectum after confirmation by per rectal biopsy and operated for that were regularly followed during their early and late post operative period. After admission detailed history was taken from each patient which included complaint related bleeding per rectum, altered bowel habits, weight loss, etc with duration. Any significant past or personal history was also noted. After general examination detailed per rectal examination was done to evaluate the extent of growth. Routine blood investigations were done followed by investigations related to rectal mass were done. These included Tumour marker Carcino Embryonic Antigen (CEA), ultrasound whole abdomen, CT scan with contrast (oral, intravenous and rectal) upper and lower abdomen, histopathological examination of mass taken during proctoscopy.

Management of cancer rectum depends upon its extent, part of rectum involved, distance of tumour in cm from anal verge, involvement or not of sphincters, metastasis, involvement of adjacent structures, etc.

Early and late complications evaluated were related to:

- Abdominal wound
- Perineal wound

- Colostomy
- Bladder habit
- Sexual function
- Local recurrence
- Any other

Wound sepsis was considered in all patients who developed cellulitis or discharged from the wound site. All patients were catheterised intraoperatively, the patient who developed retention of urine after removal of catheter on 3rd or 4th postoperative period, were considered as urinary incontinence. Urinary infection was confirmed by complete urinary examination and urine culture and sensitivity. The patients who had difficulty in erection or had decreased libido were considered as sexual dysfunction.

RESULTS

Total cases which were operated as palliative or curative means were 56 among these curative procedures were done in 26 cases (17 Abdominoperineal Resection with End Colostomy & 9 Anterior Resection) and rest were palliative. The 41 cases were operated on planned way and 15 in emergency. The male patients were outnumbered female patients (36/20). Most of the cases reported between 46 to 60 years age group.

Out of total 56 cases (36 males and 20 females), APR + EC was done in 17 patients (14 males and 3 females), AR in 9 patients (5 male and 4 female) and palliative colostomy was done in total 30 cases (17 male and 13 female). Most common curative procedure was APR. In 4 patients AR + DC was done (2 males and 2 females).

Urinary infection commonly occurred in older age group (> 60 years) with incontinence occurred in 3.5% of cases and urinary infection occurred in

8.9% of cases. Incontinence was not seen in female patients. 11.7% cases of APR + EC developed urinary infection and 10% of cases with palliative colostomy developed urinary infection. 11.7% cases of APR + EC develop urinary incontinence. Most of the urinary infection were reported in APR + EC. Neither urinary infection nor incontinence had been reported in cases with anterior resection (Table 1).

Wound sepsis was seen in 15.3% of cases operated for Ca Rectum. 7.6% patients developed abdominal wound sepsis. 11.7% of patients those underwent APR develop early perineal wound sepsis. Non-healing of perineal wound was seen in 29.4% (APR+EC) cases.

Most common complication seen with colostomy was peristomal skin irritation. Single case was seen with ischaemia of colostomy. Retraction of colostomy was not found in these cases (Table 2). Late urinary complications occurred in 12.5% patients mostly in older age groups. These complications were more common in APR+EC followed by palliative colostomy patients.

As can be seen in Table 3 colostomy prolapse and stricture were seen in one patient each, both in the male sex. Parastomal hernia and retraction were not reported.

3.8% patients develop intestinal obstruction after underwent curative procedure. 33.3% patients develop stricture at the anastomosis site after anterior resection. 23% patients develop recurrence of cancer after curative procedure. 14.2% patients underwent operative procedure were expired during their follow up (Table 4, 5).

Mortality rate was very high in patients with palliative colostomy [8 (26.6 %)]. Postoperative death after curative resection was 2/26 (7.6%).

TABLE 1: Distribution of early complications

Complications	Male		Female		Total	
	No	Percent	No.	Percent	No.	Percent
Urinary infection (n=56)	3	8.3	2	10	5	8.9
Urinary incontinence (n=56)	2	5.5	0	0	2	3.5
Perineal wound related (n=17)	2	14.2	0	0	2	11.7
Abdominal wound related (n=56)	2	5.5	0	0	2	3.6
Colostomy related (n=51)	6	18.2	5	27.8	11	21.5

TABLE 2: Distribution of cases with early complications of colostomy, according to the procedures

Procedure	Peristomal skin irritation		Retraction		Ischaemia	
	No of cases	Percent (%)	No of cases	Percent (%)	No of cases	Percent (%)
APR + EC (n=17)	1	5.8%	0	–	0	–
AR + DC (n=4)	0	–	0	–	0	–
Colostomy (n=30)	9	30%	0	–	1	3.3%
Total (n=51)	10	19.6%	0	–	1	1.9%

TABLE 3: Distribution of cases with late complication of colostomy according to the procedure

Sex	Parastomal hernia		Prolapse		Retraction		Stricture	
	No of cases	Percent (%)	No of cases	Percent (%)	No of cases	Percent (%)	No of cases	Percent (%)
Male (n=36)	0	–	1	3%	0	–	1	3%
Female (n=20)	0	–	0	–	0	–	0	–
Total (n=56)	0	–	1	1.9%	0	–	1	1.9%

TABLE 4: Distribution of cases with other late complications according to sex

Sex	Intestinal obstruction		Anastomosis stricture		Recurrence of cancer		Death	
	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)	No.	Percent (%)
Male (n=36)	1	2.7%	2	40%	4	21%	4	11.1%
Female (n=20)	0	–	1	25%	2	28.5%	4	20%
Total (n=56)	1	3.8%	3	33.3%	6	23%	8	14.2%

TABLE 5: Recurrence and mortality in relation to the procedure performed

Procedure	Recurrence		Mortality	
	Number	Percent	Number	Percent
APR + EC	3	17.6 %	1	5.8 %
AR ± DC	3	33.3 %	1	11.1 %
Total	6	23 %	2	7.7 %

DISCUSSION

Perineal wound complications following APR are a common and significant problem, and include wound infection, abscess, dehiscence, delayed healing, and persistent perineal sinus. Anastomotic

leak remains the most devastating surgical complication after anterior resection. Benign anastomotic strictures after rectal cancer surgery are also common.

The creation of intestinal stomas for diversion of enteric contents is an important component of the surgical management of several gastroenterological disease processes. Complications of stoma creation remain common, despite extensive measures aimed at reducing them.

In this study, the various procedure specific complications that occur postoperatively in patient with rectal carcinoma were analyzed. The complications that occur within 2 weeks were considered early and after that were placed into late complications. The patients were followed for an average 14.5 months. The operations done were either curative or palliative. Total of 56 patients were operated for carcinoma rectum, out of these 36 were males and rest 20 were females.

In this study 17 cases (30.3%) were reported between 46 to 60 years of age group. 31(55.3%) cases reported between 31 to 60 years of age group. The minimum age of patient, operated for carcinoma rectum was 13 year male. Maximum age of patient operated for carcinoma rectum was 80 year female. In female 7 (35%) cases reported between 46 to 60 years age group, whereas in male equal number of cases were reported in both 31 to 45 years and 46 to 60 years of age group, 10 out of 36 cases (27.7%) each. In the study of Shrikhande *et al* ^[1] they found that the mean age of incidence was 50.3 ± 13.9 years with a male predominance was noted. They reported the high incidence of these cancers in the urban population and amongst young Indians. Singh *et al* ^[2] in their study found 28.6% patients with colorectal cancer, were younger than 40 years.

In this study, total 56 cases were operated and out of these 36 were males and rest 20 were females. In male patients, abdominoperineal resection with end colostomy was done in 14 (39%) cases, whereas in female patients it was done in 3 (15%) cases. Anterior resection \pm diversion colostomy was done in 5 (13.8%) male patients and 4 (20%) female patients. Palliative colostomy was done in 17 (47.2) male and 20 (65%) female patients. Shrikhande *et al* ^[1] found that the male predominance for rectal cancer. Lockhart

Mummary^[3] also reported male predominance of rectal cancer.

During the early postoperative period 5 (8.9%) cases had urinary infection and 2 (3.5%) had urinary incontinence. Most of the urinary infection occurred in older age group. In 61 to 75 years of age group 3 (23%) cases had urinary infection whereas in 31 to 45 years of age group, 1 (7.1%) case developed urinary infection. No such cases had been found in younger age group below 30 year of age. In APR+ EC urinary infection was found in 2 (11.7%) cases and in colostomy it was seen in 3 (10%) cases. No such incidence was noted in anterior resection. Urinary incontinence was found in 2 (11.7%) cases and was only seen in operated case of abdominoperineal resection and patient required prolonged catheterisation. No urinary incontinence was found in operated case of anterior resection and colostomy. In late post operative period, during follow up urinary infection was developed but no de novo cases of urinary incontinence was seen. The patients, who developed early urinary incontinence, were resolved with time. Seven (12.5%) cases developed late urinary complication in form of infection. In APR + EC, 5 (29%) cases developed late urinary infection and in colostomy 2 (6.6%) cases develop late urinary infection. No such incidence was found in AR \pm DC cases. In patient with abdominoperineal resection 3 (75%) cases were seen in age group of 61 to 75 years. Most of the cases occurred in older age group. All cases of urinary infection were in male patients. Del Rio *et al* ^[4] reported 31.3% urinary complications in early post-operative period which were reduced to 13.3% after 12 months and 6.6% after three years. Wydra *et al* ^[5] reported overall urinary infection in 10.7% of cases and urinary incontinence in 7.1% of cases in early post operative period and only urinary incontinence was reported in 2 (7.1%) cases as late complication. Daniels *et al* ^[6] reported overall urinary complications in 59% of cases in women who were operated for cancer rectum, of which 18% had stress incontinence.

Overall number of cases that developed wound sepsis were 4 (15.3%) including both abdominoperineal resection and anterior resection groups. Out of 17 cases that were operated as APR + EC, 2 (11.7%) cases developed perineal sepsis in early postoperative period and 2(11.7%) cases developed abdominal wound sepsis. No abdominal wound sepsis was seen in 9 cases that were operated as anterior resection. In late postoperative period the most commonly seen wound complication was perineal wound sepsis and non-healing. Out of 17 cases that were operated as abdominoperineal resection 5 (29%) cases developed non-healing perineal wound with purulent discharge. In male patients wound infection developed in 4 (28.5%) cases and in female 1 (33.3%) case, with no significant difference of incidence between male and female ($p=0.12$). No complication of abdominal wound was seen in late postoperative follow up. Wydra *et al*^[5] reported 32.1% incidence of wound complication in overall period and 9.8% in late postoperative period in their study among the patients that were operated for cancer rectum. Meyer *et al*^[7] reported 17.1% incidence of perineal wound infection. Luna-Perez *et al*^[8] reported the perineal wound infection rate of 14.6% in their study. Artioukh *et al*^[9] reported impaired healing of the perineal wound in 10 (26%) of 38 patients and found that 4 of them (11%) the wound remained unhealed in 1 year after surgery.

The complications of colostomy in this study were peristomal skin irritation, 10 (19.6%) cases, ischaemia, single (1.9%) case in early postoperative period and a single case each of prolapse (1.9%) and stricture (1.9%) were found as late complications. No significant difference was seen in incidence of colostomy complication among males and females. No incidence of parastomal hernia and retraction were seen. There were no significant differences in complications among emergency cases as compared with planned cases in this study. Pearl *et al*^[10] reported peristomal skin irritation in 42.1% cases. Brian^[11]

reported the incidence of peristomal skin irritation ranging from 3% to 42%. Park *et al*^[12] reported skin irritation in 12% cases and partial necrosis of stoma in 5% of cases as early complication and the late complications they reported were skin irritation in 6%, prolapse in 2% and stenosis in 2% of cases.

The complication, associated with anastomosis found in this study was anastomotic stricture. Out of nine cases that were operated as anterior resection, 3 (33.3%) cases developed anastomotic stricture. Two of them were successfully treated conservatively with gradual dilatation on regular interval and one patient developed local recurrence at the anastomotic site after development of stricture. None of the patient developed anastomotic leak. So that the significance of diversion colostomy cannot be elaborated, as did in 4 out of 9 cases. Pronio *et al*^[13] reported 4.8% (62/1290) of patients developed anastomotic leakage. Leester *et al*^[14] reported the overall rate of anastomotic leak as 6.4 per cent; it was 5.1% (9/175) without and 9.4% (7/74) with a protective stoma. Phillips *et al*^[15] reported 10.3% incidence of anastomotic leak.

The prevalence of intestinal obstruction seen in our study was 1/26 (3.8%) among the patients that underwent curative procedure. The patients had undergone abdominoperineal resection with end colostomy but had multiple episodes of sub acute/ acute intestinal obstruction. On re-exploration there were dense adhesions between ileum and pelvic wall, so the ileostomy was performed. Baxter *et al*^[16] reported 15% incidence of small bowel obstruction in patients who underwent post operative radiotherapy and 9% in patients of nonirradiated group.

The recurrence seen in this study was in 6 (23%) cases that underwent curative resection. The recurrence rate was 21% (4 cases) in males and 28.5% (2 cases) in females. In this study the recurrence was seen in 3 (17.6%) cases with APR and 3 (33.3%) cases of anterior resection. Heald^[17] reported 2.7% local recurrence after curative total mesorectal excision. Zhao *et al*^[18] reported

local recurrence rate of 6.5% after abdominoperineal resection, 2.2% after sphincter preserving operation.

In this study, death in early postoperative period was reported in 2 (3.5%) cases. They were in advanced stage and not amenable for curative resection, presented as acute intestinal obstruction. Palliative colostomy was done in emergency. In late postoperative period the mortality was seen in 8 (14.2%) cases. Among these singular mortality was reported in each of abdominoperineal resection (5.8%) and anterior resection (11.1%). Highest mortality, 6 cases (20%), was found in cases with palliative colostomy during late postoperative period. Postoperative death after curative resection was 2 out of 26 cases (7.6%). Wydra *et al* ^[5] reported 7% mortality rate after curative resection. Erection dysfunction was seen in 5 (29.4%) patients that were operated as abdominoperineal resection. Hendren *et al* ^[19] reported 32% impotence in men after abdominoperineal resection.

CONCLUSION

Carcinoma rectum shows male preponderance with no significant difference in complications depending on gender. Abdominoperineal resection with end colostomy was the most commonly performed operative procedure. The most devastating complication was local recurrence. Incidence of local recurrence was low after abdominoperineal resection as compared with anterior resection. The most common morbid complication was non-healing of perineal wound with purulent discharged that required nursing care for prolonged duration. Most of the female patients attended medical facility in advanced stage. Early diagnosis of rectal cancer is important to avoid or minimised nature and severity of post operative complications. This is possible only when patients are aware of preventive measures and approached doctors for slightest change in bowel habits.

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