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Original Research Article

Clinical profile and factors affecting surgical outcome of colorectal carcinoma in rural India: a study of 60 cases

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ABSTRACT

Background: Colorectal carcinoma is the most common of the gastrointestinal tract malignancy. Aim of our study is to look for the clinical profile and factors affecting the surgical outcome of colorectal malignancy in rural India.
Methods: In this study, 60 patients, whose surgery and follow up was performed by same correspondent Surgeons between years Nov 2011 to Oct 2013, were prospectively analyzed.
Results: Of the 60 cases analyzed, we encountered the highest number of cases in the sixth and seventh decade in both sexes with male to female ratio 1:1. Alternating bowel habits, bleeding per rectum, giddiness and anorexia, weight loss, pain in abdomen were the most common presenting complaints with mean duration of symptoms was 6 months before diagnosis. Rectum and recto-sigmoid was the commonest site for occurrence of large bowel cancer (56.66%). Duke's system of staging with Turnbull et al modification shows majority of cases (50.00%) in category C. Well differentiated adenocarcinoma is the commonest histological pattern noted in more than half of cases. Post-operative recurrence was detected in 16.67% of cases with 33.33% of cases have not had a detectable recurrence to date.
Conclusions: Rectum being the commonest site for occurrence of colorectal malignancy, diet and other predisposing factors could not be implicated in the occurrence. Age, weight loss, emergency admission, operation type, advanced stage of disease at presentation, loss of regular follow-up and lower socio-economic status of patients of rural India significantly affect the outcome of surgery.

Keywords: Abdomino-perineal resection, Colorectal carcinoma, Colectomy, Histopathology

INTRODUCTION

Colorectal cancer (CRC) is the second leading cause of death from cancer in western countries.[1] Forty to fifty percent of patients who undergo potentially curative surgery alone ultimately relapse and die of metastatic disease.[2] The most important prognostic indicator of survival in early colon cancer is the stage of the tumor, determined by the depth of penetration through the bowel wall and the number of involved lymph nodes.[3] Currently 60% of malignant diseases occur in persons over 65 years of age. More than half of them are over 70 years age and one fourth of them are over 80 years old.[4] Although on a smaller scale than in the west, CRC is on important health problem in India, particularly so because of the misconceptions and ignorance those exist among the people about bowel habits and changes in them.[5,6]

The five year survival rate for CRC has improved slightly over the past 20 to 30 years.[7] Although results are improved overall prognosis for patients of CRC is still same. There is greater need for early diagnosis and further identification of prognostic factors which may decide final outcome in individual case.

METHODS

This prospective study was conducted in the Department of General Surgery of Government Medical College Miraj, and PVPGH Sangli, Mumbai, India from November 2011 to October 2013, on 60 patients of primary carcinoma of the colon and rectum or as recurrences during follow up. Written informed consent taken from patient and their relatives in their respective native language and ethical clearance was taken from Institutional ethical committee. In all patients, a thorough clinical examination was done after taking a detailed history to establish clinical diagnosis. The patients who were affording were sent to private institutions for colonoscopy, sigmoidoscopy. Diagnosis was confirmed by histopathology in all cases. All routine investigations along with stool examination for occult blood, abdominal X-rays, Ultrasonography of abdomen and pelvis, CECT scan (abdomen and pelvis) were performed in all nonemergency cases. A preoperative CEA estimation was performed in those who could afford the test.

The type of operation was determined according to site and extent of the malignancy, presence of metastasis and general condition of patients. After proper bowel preparation (in non-emergency cases), patients of colonic cancer were operated for right hemicolectomy, left hemicolectomy, transverse colectomy or sigmoid colectomy. A de-functioning colostomy was reserved for those patient suspected to have a high fecal load. Patients with rectal cancers were treated with an anterior resection with anastomosis, abdomino-perineal resection (APR) depending upon the level of the growth. Hartmann's operation was performed with written inform consent whenever restoration of continuity was not feasible. For inoperable growths a laparotomy and biopsy was done along with diverting colostomy whenever obstruction was present. Adjuvant chemo/radiotherapy was given postoperatively taking into consideration of the histopathological report of the surgical specimen and in patients suspected to have residual disease following surgery.

After discharge patients were followed up as per patients compliance and were clinically examined. Any complication occurring due to the operation was looked for. Detailed information pertaining to each case was recorded and the data tabulated and summarized. The findings in this study were analyzed keeping in the aims and objectives of the study and were compared to the other studies.

RESULTS

A total of 60 patients of colon and rectal carcinoma were studied, which comprised of 30 male and 30 female patients. We encountered the highest number of cases (50.00%) in the sixth and seventh decade (Table 1). The common presenting complaints in non-emergency cases were alternating bowel habits, bleeding per rectum, weight loss, anorexia and giddiness, pain in abdomen and palpable lump in abdomen in CRC patients (Table 2). Rectum and recto-sigmoid was the commonest site (56.66%) for occurrence of large bowel cancers in our series.

Table 1: Age and sex distribution.

Age in years	Males	Females	Total Patients	Percentage
21-30	1	3	4	6.67%
31-40	4	3	7	11.67%
41-50	3	2	5	8.33%
51-60	6	5	11	18.33%
61-70	15	15	30	50.00%
71-80	1	2	3	5.00%

Table 2: Symptoms / clinical presentation in colorectal carcinoma.

Symptoms	Site	Our study	Muir et al[19]
Alternating bowel habits	Colon	46.15%	58%
	Rectum	76.47%	8%
Bleeding per rectum	Colon	46.15%	35%
	Rectum	88.23%	80%
Giddiness and anorexia	Colon	61.53%	4%
	Rectum	58.82%	
Weight loss	Colon	38.46%	25%
	Rectum	47.05%	
Pain in abdomen	Colon	80.76%	50.80%
	Rectum	58.82%	5%
Palpable lump in abdomen	Colon	34.61%	32.3%
	Rectum	11.76%	
Mean duration of symptoms		6 months	5.5-6.5 months

Table 3: Comparison of Duke's staging in our study with other studies.

Stage	Our study	Shah and Wani	Jarvinen et al	St. Mark's Hospital Series.
A	6.67%	2.8%	20%	15%
B	30.0%	95.3%	41.3%	35%
C	50.0%		13%	50%
D	13.33%			

Table 4: Histological grading of adenocarcinoma in CRC in our series.

Grade	No of patients	Percentage
Well differentiated	48	80
Moderately differentiated	10	16.67
Poorly differentiated	2	3.33

A preoperative ultrasonography of abdomen and pelvis was performed in all cases. It showed abnormal findings

in 66.67% cases with 8.33% of cases were showing metastatic involvement in the liver. In 46.67% cases colonic wall thickening and or growth and rectal wall thickening and or growth was noted. We found carcinoma of large intestine to be adenocarcinoma in (97.33%) of cases. Most of the carcinomas were well differentiated adenocarcinoma (80.00%). Moderately differentiated comprised 16.67% and poorly differentiated 3.33% of cases.

Table 5: Follow up of cases of colorectal carcinoma in our series.

Follow up (in months)	Number of patients	Percentage
0-3	42	70
3-6	22	36.67
6-9	13	21.66
9-12	6	10.0
12-15	4	6.67
15-18	3	5.0
Lost follow up	18	30.0

We used adjuvant radiotherapy in 2 patients (3.33%) with advanced cancer who were suspected to have residual tumor after the operation. Chemotherapy was offered to 83.33% of patients with lymph node invasion and or extramural tumor extension. Combined chemo and radiotherapy was given in stage C patients 6.67%.

Of the total followed up patient (70.00%), recurrence was detected in 16.67% of cases. 12 cases have advanced disease at the time of diagnosis (20.00%). Local recurrence accounted for 3 patients (5.00%), while distant metastasis for 1.67%. 33.33% of cases have not had a detectable recurrence till date.18 patients (30.00%) could not be followed up in this series. We had 16 deaths (38.10%) amongst 60 patients treated for CRC. Nine (15%) of those deaths were due to advanced or recurrent disease. 7 cases died of an unrelated cause.

DISCUSSION

Colorectal cancer is the second leading cause of death from the cancer in the western countries. Data from Indian series shows a different trend than that from western countries. It is possible that the epidemiology of the disease is different in India. We encountered highest number of cases (50%) in 6th and 7th decade. Homji DR (1972) reported an average age of 51 years as presenting age for colorectal carcinoma.[8] In our series, the male: female ratio of colorectal carcinoma was 1:1. Dukes and Bussey consider age and sex as important factor in the study of natural history of these growth.[9] Data from our series shows a similar trend to that of the western countries (Table 3). This may be due to growing urbanization and adoption of western countries is emerging.

In our study, there was no history of the premalignant condition mention as

- Familial polyposis coli
- Familial non-polyposis colonic cancer
- Ulcerative colitis, crohn`s disease
- Past history of colonic and breast cancer
- Family history of carcinoma colon.

It is possible that the low incidence of these conditions in the tropics is responsible for such picture which is in accordance with the findings of Choudhary and Rey's series.[10] It has been stated by Joshi that majority of the large bowel cancers in the tropics are de novo cancers not secondary to any of the above conditions.[5] Low fiber diet, high fat diet, previous cholecystectomy, ureterosigmoidostomy or a sedentary lifestyle are the other predisposing factors of colorectal carcinoma.[11] In our study, we could not correlate the effect of high residue diet to colorectal carcinoma due to varied and inconsistent dietary habits of people, westernization of dietary habits and their non-compliance to such interrogation. Ssali and others have reported that factors other than diet may be responsible in the development of colorectal carcinoma, especially in areas where the fiber content is high as in the tropics.[12]

In our study, we have found the incidence of non-emergency cases to be 66.67%. Intestinal obstruction accounted for 23.33% of the emergencies while perforation peritonitis or abscess formation accounted for 10.00%. Loose motions and constipations were seen in 46.15% of colonic carcinoma. Diarrhea was more than constipation and classical alternating diarrhea and constipations were seen only in 4 cases. 76.47% patients presented with these bowel complaints. Muir found bowel symptoms in 58% and 70% cases with cancers of colon and 8% patient with carcinoma of the rectum. Bleeding per rectum with or without mucus was one of the common complaints and was a dominant feature in 46.15% patients with colonic carcinoma and 88.23% of rectal carcinomas.

Muir has found rectal bleeding in 80% of his cases of rectal cancer and in about 35% of patients of colonic cancer. Giddiness and anorexia occurred in 61.53% in colonic carcinoma and 58.82% in rectal carcinoma patients and weight loss occurred in 38.46% of colonic 47.05% of rectal carcinoma patients. They are relative uncommon in western series. Muir reported anorexia in 4% and loss of weight in 28% of his patients.[13] The higher incidence in our series may be due to more patients coming with more advanced form of disease causing more constitutional symptoms. In our study, 80.76% patients of colonic cancer presented with abdominal pain, either dull ache or an intestinal colic. In case of rectal cancer, pain (during defecation or perianal) and tenesmus was complained of by 58.82% and 70.58% patients respectively. Pain may be seen in late stages due to involvement of sacral nerves. In Muir`s study pain was

a frequent complaint in colonic cancer, occurring in 50-80% cases, but occurred in only 5% cases of rectal carcinomas. The higher incidence of pain amongst rectal cancer patient might be due to more advanced stage of tumours as early tumours are generally painless. In Muir`s study the mean duration was 5.5-6.5 months. Although our findings are comparable it was probable that many of our patients ignored or neglected their early symptoms, as the tumours that we encountered were quite advanced for their duration in most of the cases. Similar reasons for diagnostic delay were stated by Joshi et al.[5]

In 43.37% patients, other medical diseases were present such as diabetes mellitus 5%, hypertension 16.66%, respiratory diseases 16.66%, ischemic heart diseases 5%. Although not related to the development of colorectal carcinoma, these diseases had a bearing on the operative management and the ultimate outcome. A wide range of complaints were noted in non-emergency cases of colorectal carcinoma. Tendency of our patients to neglect or overlook minor variation in bowel habits and label them as diarrhea or dysentery (which is endemic in our country) might have shown the lower incidence of bowel complaints in our series. Most of the patients in our study has anemia (91.30%) compared to Muir, which was up to 40%, must be related to low socio-economic status of patients and advanced stage of disease.[13] Poverty, ignorance, negligence and fear of cancer and subsequent surgery were important reasons for delay in presentation to the clinician. Similar reasons for diagnostic delay were stated by Joshi et al.[5] Holliday and hard castle have reported similar conditions in the west, although on a smaller scale.[6]

Rectum and the recto-sigmoid was the commonest site for occurrence of large bowel cancer in our study (56.66%). In the study by Smiddy et al, the incidence of rectal and recto-sigmoid growth was 57.4%, while Cady et al have reported incidence of rectal and recto-sigmoid growths to be around 60% and 62% respectively.[14-16]

A preoperative ultrasonography may be helpful to detect abnormalities. But being inexpensive, easy availability and non-invasive, the major limitation is its operator dependence and inability to detect hepatic metastasis less than 1 cm.[17]

Pathologically, carcinoma of the large intestine is an adenocarcinoma in over 98% of cases.[17,18] In our series, we found it to be adenocarcinoma in 97.33% of cases. Most of the carcinomas were well differentiated adenocarcinoma (80.00%). Moderately differentiated adenocarcinomas comprised 16.67% and poorly differentiated 3.33% of cases.

We employed the Duke's staging with the Turnbull et al modification.[18,19] It is essentially a pathological staging system applied to operative specimens since complete accurate assessment is difficult by clinical examination, radiology or endoscopy. Our findings are similar to those of Shah et al, who have reported an incidence of 95.3% of Duke`s B and C and 2.8% of category and tumours.[20] Jarvinen et al have reported the distribution to be 20%, 41.3% and 13% in categories A,B and C respectively.[7] In St. Mark's Hospital series of operated cases, 15% were in the category A, 35% in category B, while 50% in category C.[18]

Of the 60 cases of colorectal carcinoma in our study, we operated on all patients. 86.66% patients underwent a resection of the tumour. The resection was curative (leaving behind no gross tumour) in 66.67% and palliative in 20.00%. In 13.33% cases a palliative surgery was planned in form of a bypass. Our findings differ from those of Jarvinen et al who reported an overall resectability rate of 93.10% and a curative resection rate of 75.9% probably due to the advanced nature of growths in our patients who presented late.[7] The type of operation for the colonic cancer was determined by those site and extent of the growth, the nodal status, presence of distal metastasis and the general condition of the patient. We performed right hemicolectomy in 19.23% of cases, left hemicolectomy in 30.77% of cases, transverse colectomy in 7.69%, sigmoid colectomy in 34.61% and transverse colostomy in 7.69% of cases. For rectal and rectosigmoid cancers, APR performed in 58.82% cases. An anterior resection with anastomosis was possible in 23.53% cases. Primary anastomosis without a colostomy for sigmoid and anterior resection was possible in most cases. A Hartmann`s procedure was performed in 8.82% cases. Up to 45 to 50% of rectal tumors can be treated by Sphincter saving operation as reported by Jarvinen et al.[7] But unavailability of staplers, as they are very costly and our patients cannot afford it, was the limiting factor in our setup.

While no intra operative complications was noted, post-operative complication occurred in 33 patients in our study (45.00%) which is very high as compared to the results stated by Jarvinen et al (15.3%) after surgery for CRC. Wound infection is the commonest post-operative complication in our series. It was noted in 23.33% of the operated patients, most of them occurred after APR (30%), the fact well described by Jarvinen et al, who has found the rate to be more than 60%.[7]

Incidence of clinically significant anastomotic leaks in most series has been reported as 3-18%.[7,21] In our study, we found it to be 3.33% which is comparable with their studies. We found urinary complications as urinary tract infections and retention of urine in 5.00% patients. In most cases, patients responds to ambulation, reinsertion of Foley's catheter for another few days and cholinergic drugs. Retention of urine is a common complication after rectal excision. Watson has shown that about 50% of male patients undergone APR have some difficulty in establishing normal micturation, but it is usually transient. Colostomy complications were noted in 16.00% of patients during their follow up. Complications were infection 2 cases (8.40%), prolapse 1 patient (4.0%) and

herniation 1 patient (4.0%) which were managed by conservative means. Various definitions of operative mortality are in use most authorities suggest that deaths within 30 days interval from operation be included in operative mortality. In our study, no postoperative mortality was encountered. 2.5% mortality was reported by Whittaker in patient treatment.[22] Improved anesthesia techniques and invasive perioperative monitoring have allowed reduction in the mortality, reported by Miles and in present day conditions it should be less than 2%.[17]

We used adjuvant radiotherapy in 2 patients (3.33%). It was given as teletherapy with a linear accelerator, the dose being 5000 cGy given as daily fractions of 200 cGy over 35 days (5 weeks). Chemotherapy was offered to 83.33% of patients with lymph node invasion and or extramural tumour extension. 5-Fluorouracil is the chemotherapeutic agent of choice in colorectal carcinoma especially adenocarcinoma. Combined radiotherapy and chemotherapy was given in stage C patients (6.67%). In our series, 70% of the total patients were followed up. 18 patients (30.0%) could not be followed up (Table 5). Recurrence was detected in 10 cases (16.67%). Local recurrence accounted for 3 patients while distant metastasis for 1 patient. Both local and distant recurrence occurred in 6 cases. At the end of 5 years the recurrence rates after radical surgery for colorectal carcinoma range from 31-59%. The local recurrence rates and those for distant metastasis are between 15-20% and 10-15% respectively, while that for combined recurrence is 15-20%.[23] The less incidence of recurrence in our series may be due to loss of follow up of the patient. Still inspite of the high percentage of APRs in our series, the recurrence rate has not decreased. Jones and Thomson have reported that recurrence rate does not increase in patients treated by a restorative resection.[24]

In our series, we had 16 deaths (38.10%) amongst 60 patients treated for colorectal carcinoma. We could not estimate 5 year survival rate as none of our patient have yet completed 5 years since diagnosis. The 5 year survival rates have been reported as 82-100% for stage A, 60-80% for stage B, 26-74% for stage C for colonic cancers and 78-93%, 45-77% and 22-50 stages A,B,C for rectal carcinomas respectively.[25]

CONCLUSION

Colorectal carcinoma is commonest in the sixth and seventh decade, but it is seen in younger age group also. Females are as much prone to develop CRC as males. Commonest site of CRC is the rectum including rectosigmoid junction. Diet and other predisposing factors could not be implicated in the occurrence of CRC, in our study. Bleeding per rectum, alternating bowel habits, anorexia, weight loss were the commonest presenting complaints.

Anemia is seen in more than four fifth of the patients and is more common as compared to western studies. Simple digital rectal examination can diagnose most of cases of low rectal carcinomas. Well differentiated adenocarcinoma is the commonest histological pattern noted (Table 4).

Radiological imaging with CT scan, USG abdomen and pelvis along with colonoscopy, sigmoidoscopy and proctoscopy with biopsy help to confirm the diagnosis of CRC. APR even today remains the commonest operation performed for rectal carcinoma. A major limiting factor for performing anterior resection is very high cost and lack of free availability of staplers at our setup. Adjuvant therapy considered in advanced cases to reduce the risk of local recurrence and improve survival.

Continuing medical education programme for family physicians and health awareness campaigns with mass education programme is must for early diagnosis. To conclude, age, weight loss, emergency admission, neighboring organ invasion, operation type, major morbidity, tumor size, and type, lymph node metastasis, Dukes classification, local recurrence and distant metastasis, low socioeconomic status, lack of awareness are significant factors affecting prognosis of colorectal carcinoma.

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