

# Outcome of Obstructing vs Nonobstructing Colorectal Carcinomas: Comparative Study at Tertiary Care Hospital in Kashmir

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## ABSTRACT

**Background:** Colorectal cancer (CRC) is the commonly diagnosed malignancy presenting either in obstruction or without obstruction. Bowel obstruction (BO) is usually a complication of advanced cancer, significantly reducing the quality of life. We aimed to study the outcomes of these obstructed colorectal cancers requiring emergency intervention and compare it with nonobstructed cancers.

**Materials and methods:** In our observational comparative study, patients were divided into groups on basis of their presentation and site of lesion: nonobstructing colon group/obstructing colon group nonobstructing rectum group/obstructing rectum group.

**Results:** A total of 232 patients with known modes of presentation between 2015 and 2018 were included; 144 colonic, 88 rectal carcinomas with 71 being completely obstructive ones. Our study showed higher recurrence in obstructive groups with local recurrence being more common. The median interval for recurrence was early in obstructive group ( $p < 0.001^*$ ). The overall 5-year survival rates were better in Nonobstructing colon group, ( $p = -0.046^*$  in OR vs NOR) ( $p = -0.031^*$  in OC vs NOC). 5-year disease-free survival rates statistically insignificant ( $p = 0.203$  in NOC and OC groups), ( $p = 0.307$  in NOR and OR groups). Immediate post-op, complications except for SSI, there was no significant difference between the two groups. Our study showed higher proportion of R0 resection in NOC groups as compared with obstructive groups ( $p = 0.021^*$  in OC vs NOC and  $p = 0.037^*$  in OR vs NOR) with better lymph node retrieval in NOC groups.

**Conclusion:** On comparing outcome of patients who had completed multi-modal therapy in both groups, there was significantly better outcome for patients who have presented without obstruction.

**Keywords:** CA colon, CA rectum, Colorectal carcinoma, Emergency, Malignant bowel obstruction, Nonobstructing cancer, Obstructing cancer.

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## INTRODUCTION

Colorectal cancer (CRC) is a commonly diagnosed malignant neoplasm, which ranks third among all cancers in terms of incidence and second in terms of mortality,<sup>1</sup> generally presenting to us in either obstruction or without obstructive features. In colorectal carcinoma patients, bowel obstruction (BO) is usually a complication of advanced cancer, significantly reducing the quality of life. The patients are in need of emergency intervention to relieve obstruction. Cancer-directed therapy is delayed for these patients as the obstruction is to be relieved first. The surgical and oncological outcome of this group of patients is likely to be different. Our study aims to study the outcomes of these obstructed colorectal cancer requiring emergency intervention either in form of pre-therapy diversion colostomy or curative resection and compare it with nonobstructed colorectal cancers.

## MATERIALS AND METHODS

Our study was an observational comparative hospital-based study conducted under the Department of General and minimal invasive surgery, SKIMS, Srinagar, involving colorectal carcinoma patients who had been planned for definitive colorectal surgeries for colon and rectal cancers with the aim to observe and compare the outcomes of the two groups of colorectal carcinoma patients, one with obstructing malignancy and the other without any features

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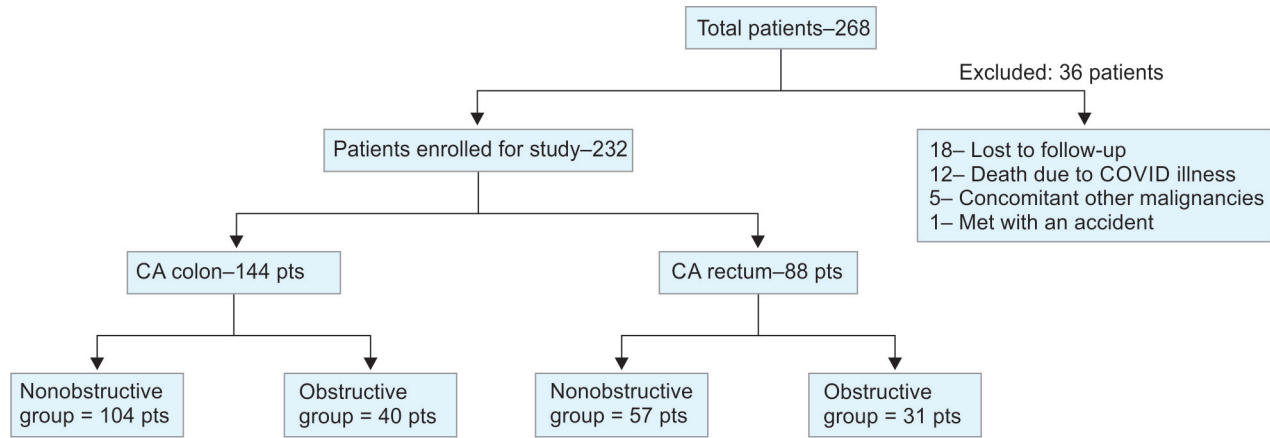
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**Conflict of interest:** None

of obstruction. Patients of stages II and III colorectal carcinomas were included and those with T1 or T2 lesions, other concomitant malignancies, metastatic disease/stage IV, perforating lesion were excluded. Patients enrolled were divided in groups based on their presentation and site of lesion into:

- Nonobstructing colon (NOC) group and obstructing colon (OC) group.
- Nonobstructing rectum (NOR) group and obstructing rectum (OR) group.

Flowchart 1: Distribution of our study patient in different groups



**RESULTS AND OBSERVATIONS**

Our study included 232 patients of colorectal malignancies who underwent curative resection between 2015 and 2018, of which, 144 were colonic malignancies and the rest 88 were rectal carcinomas (Flowchart 1). Out of total 232 patients included in the study, 71 cases were completely obstructive cases that received emergency surgery amounting to about 30% of total CRC. The clinicopathological and demographic characteristics of our study patients both colonic and rectal groups are depicted in Tables 1A and B, respectively. As per the protocol, nonobstructing colonic malignancies underwent elective surgeries while as those with obstruction were managed on emergency basis and operated within 24 hours of admission in emergency settings. For rectal carcinoma cases, patients presenting with obstructive features were subjected to diversion stoma followed by neoadjuvant conventional long course chemoradiation therapy (LCCRT) or intravenous infusion of 5-fluorouracil (5-FU) along with radiation therapy as was done with those patients of NOC presentations. After completion of NACRT, patients underwent surgical resection if the rectal growth was deemed operable. The study patients who underwent definitive surgery were then offered adjuvant therapy based on the histopathology report. Patients were followed and outcome of both the groups were noted. The outcomes results of our comparative study is shown in Table 2A for colonic group and in Table 2B for rectal group of patients (Figs 1 and 2).

**DISCUSSION**

Colorectal cancer is a commonly diagnosed malignant neoplasm, present as an emergency or with chronic symptoms that are well recognized. The signs and symptoms of colorectal cancer are influenced by the location of the tumor in the colon as well as the extent of tumor or its extension into the lumen. In colorectal carcinoma patients, BO is usually a complication of advanced cancer presenting as bloating, pain, nausea, and vomiting, and it significantly reduces the quality of life. Management of colorectal carcinoma depends upon the site of lesion, presentation of disease whether obstructing lesion or nonobstructing lesion, stage of disease, and general condition of the patients. The patients of colorectal carcinoma presenting with obstruction are in much need of early and immediate surgical intervention. Need of the hour is to treat and manage these cases and it is still challenging for surgeons

**Table 1A:** Depicting clinicopathological characteristics of study population of colonic carcinoma groups

Variable	Colonic carcinomas [n (%)]		p-value
	NOC group	OC group	
Age distribution in years (Mean ± SD)	55.7 ± 12.27	58.4 ± 9.91	
Gender			
Male	59 (56.7%)	23 (57.5%)	
Female	45 (43.3%)	17 (42.5%)	
Medical-comorbidities	37 (35.6%)	13 (32.5%)	0.728
Preoperative albumin levels (mean ± SD) mg/dL	3.63 ± 0.489	4.02 ± 0.431	<0.001*
Preoperative CEA Levels (mean ± SD) ng/mL	7.54 ± 3.32	7.78 ± 4.14	0.723
Site of tumor			
Ascending colon	1 (2.5%)	1 (2.5%)	<0.001*
Descending colon	15 (37.5%)	15 (37.5%)	
Sigmoid colon	20 (50.0%)	35 (33.7%)	
Transverse colon	4 (10.0%)	13 (12.5%)	
Cecum	0	6 (5.8%)	
Transmural thickness/size/width (cm) mean ± SD	6.1 ± 0.753	7.8 ± 0.817	<0.001*
TNM stage			
T3	93 (89.4%)	34 (85.0%)	0.756
T4a	7 (6.7%)	4 (10.0%)	
T4b	4 (3.8%)	2 (5.0%)	
N0	54 (51.9%)	17 (42.5%)	0.531
N1	32 (30.8%)	15 (37.5%)	
N2	18 (17.3%)	8 (20.0%)	
II	56 (53.8%)	17 (42.5%)	0.223
III	48 (46.2%)	23 (57.5%)	
Tumor differentiation			
Well-differentiated	36 (34.6%)	6 (15.0%)	<0.001*
Moderately differentiated	54 (51.9%)	11 (27.5%)	
Poorly differentiated	14 (13.5%)	23 (57.5%)	
Time duration in hours (mean ± SD)	1.8 ± 0.47	2.2 ± 0.61	0.215

**Table 1B:** Depicting clinicopathological characteristics of study population of rectal carcinoma groups

Variable	Rectal carcinomas		p-value
	NOR group	OR group	
Age distribution in years (mean ± SD)	56.9 ± 10.79	58.4 ± 9.91	
Gender (male)			
Male n (%)	29 (50.9%)	16 (51.6%)	
Female n (%)	28 (49.1%)	15 (48.4%)	
Medical-comorbidities n (%)	18 (31.6%)	11 (35.5%)	0.709
Preoperative albumin levels (Mean ± SD) mg/dL	3.65 ± 0.458	3.34 ± 0.412	0.002*
Preoperative CEA levels (Mean ± SD) ng/mL	7.64 ± 3.56	7.86 ± 3.57	0.775
Transmural thickness/size/width (cm) mean ± SD	4.8 ± 1.93	7.1 ± 2.16	<0.001*
TNM stage			
T3	45 (78.9%)	23(74.2%)	0.787
T4a	10 (17.5%)	6 (19.4%)	
T4b	2 (3.5%)	2 (6.5%)	
N0	31 (54.4%)	12 (38.7%)	0.229
N1	21 (36.8%)	13(41.9%)	
N2	5 (8.8%)	6 (19.4%)	
II	32 (56.1%)	13 (41.9%)	0.203
III	25 (43.9%)	18 (58.1%)	
Tumor differentiation			
Well-differentiated	11 (19.3%)	3 (9.7%)	<0.001*
Moderately differentiated	43 (75.4%)	10 (32.3%)	
Poorly differentiated	3 (5.3%)	18 (58.1%)	
Time duration in hours (mean ± SD)	2.2 ± 0.67	2.6 ± 0.91	0.354

how to handle/treat these cases effectively. Our Study aimed to assess, observe and compare the outcome in the two groups of colorectal carcinoma patients, one with obstructing malignancy and the other without any features of obstruction. Our study included 232 patients of colorectal malignancies who underwent curative resection between 2015 and 2018; of which, 144 were colonic malignancies and the rest 88 were rectal carcinomas. Out of total 232 patients included in study, 71 cases were completely obstructive cases that received emergency surgery, with the incidence 30%, slightly higher to the results in a previous studies as reported by Deans GT et al. (8–29%)<sup>2</sup> and Joshua Franklyn et al.<sup>3</sup> who reported obstruction in 23% in his study. We observed that the mean age of presentation for colorectal malignancy patients was 58.4 ± 9.91 years for obstructing colonic lesions, 55.7 ± 12.27 years for nonobstructing colonic lesions while it was 59.4 ± 9.28 years for obstructing rectal lesions and 56.9 ± 10.79 years for nonobstructing lesions which was similar to study published by Peedikayil MC et al.<sup>4</sup> and higher than that reported by Prachi S. Patil et al.<sup>5</sup> There was a slight male predominance in our study with male:female ratio of

**Table 2A:** Results of comparative study between colonic groups

Outcome in terms of	NOC group [n (%)]	OC group [n (%)]	p-value
<b>Immediate outcomes</b>			
Surgical site infection	11 (10.6)	13 (32.50)	0.003
Anastomotic leak	4 (3.8)	3 (7.5)	0.631
Post-op ileus	6 (5.8)	3 (7.5)	0.701
Respiratory tract infection	16 (15.4)	9 (22.5)	0.312
Hospital stay mean ± SD (days)	8.4 ± 3.12	10.9 ± 2.65	<0.001*
<b>Oncological outcome</b>			
Type of resection			
R0 resection	101 (97.1%)	34 (85.0%)	0.021*
R1 resection	3 (2.9%)	6 (15.0%)	
No of lymph nodes harvested mean ± SD	19.8 ± 4.17	16.1 ± 3.84	<0.001*
<b>Long-term outcome</b>			
Recurrence rate			
site of recurrence	24 (23.1%)	14 (35.0%)	0.145
Local	7 (29.2%)	9 (64.3%)	0.034*
Distant	17 (70.8%)	5 (35.7%)	
Duration for recurrence in months (mean ± SD)	26.1 ± 4.16	20.4 ± 3.67	<0.001*
<b>5-year overall survival</b>			
Stage II	50 (89.3%)	11 (64.7%)	0.017*
Stage III	31 (64.6%)	13 (56.5%)	0.512
Overall	81 (77.9%)	24 (60.0%)	0.031*
<b>5-year disease-free survival</b>			
Stage II	32 (64.0)	6 (54.5%)	0.326
Stage III	17 (54.8%)	5 (38.5%)	0.321
Overall	49 (60.5%)	11 (45.8%)	0.203

1.35:1 in obstructing colon and 1.31:1 in NOC group while as it was 1.06:1 in OR and 1.03:1 in NOR. Several concomitant diseases were found in 13 patients in the OC group and 37 patients in the NOC group (32.5 vs 35.6%,  $p = 0.728$ ) and 11 patients in the OR group and 18 patients in the NOR group (35.5 vs 31.6%,  $p = 0.709$ ) which included chronic pulmonary diseases, cardiovascular disorders, hypertension, insulin-dependent diabetes, and renal dysfunction without any significant difference between the groups. As far as performance score of study patients was concerned that there was no significant difference between the obstructing and nonobstructing groups.

We found a significant difference in pre-op albumin levels of patients. Obstructing colon group had pre-op albumin levels of  $3.63 \pm 0.489$  mg/dL as compared with  $4.02 \pm 0.431$  mg/dL in NOC group ( $p$ -value < 0.001\*) and  $3.34 \pm 0.412$  mg/dL in OR group as compared with  $3.65 \pm 0.458$  mg/dL in NOR group. This can be attributed to low intake as a result of chronic subclinical obstruction in obstructive lesions. There was no significant difference in pre-op CEA levels between patients in nonobstructing group and obstructing group. In colonic carcinoma cases, the mean CEA levels in obstructing patients (OC) were  $7.78 \pm 4.14$  while as NOC group had CEA levels of  $7.54 \pm 3.32$  mg/dL. Similar results were found in the case of rectum

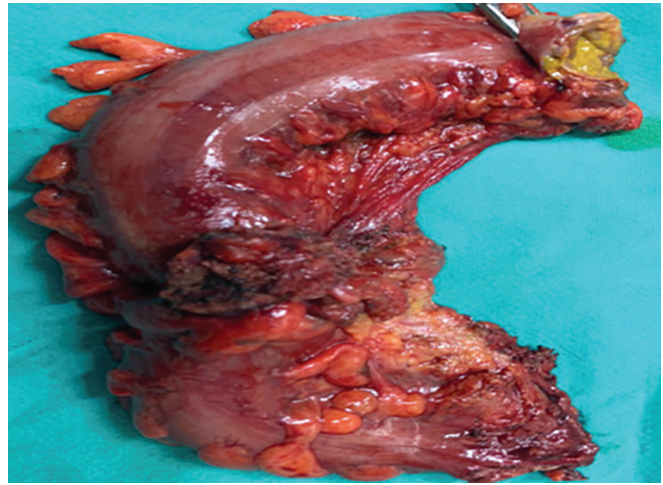
**Table 2B:** Results of comparative study between rectal groups

Outcome in terms of	NOR group	OR group	p-value
<b>Immediate outcomes</b>			
Surgical site infection	5 (8.8)	9 (29.0)	0.029*
Post-op ileus	3 (5.3)	2 (6.5)	0.818
Respiratory tract infection	8 (14.0)	6 (19.4)	0.729
Urinary retention	7 (12.3)	5 (16.1)	0.615
Hospital stay mean $\pm$ SD (days)	9.2 $\pm$ 2.87	12.7 $\pm$ 2.35	<0.001*
<b>Oncological outcome</b>			
Type of resection			
R0 resection	55 (96.5%)	23 (80.6%)	0.037*
R1 resection	2 (3.5%)	6 (19.4%)	
No of lymph nodes harvested mean $\pm$ SD	17.6 $\pm$ 4.26	15.1 $\pm$ 4.14	<0.003*
<b>Long-term outcome</b>			
Recurrence rate			
Site of recurrence			
Local	5 (29.4%)	8 (66.7%)	0.047*
Distant	12 (70.6%)	4 (33.3%)	
Duration for recurrence in months (mean $\pm$ SD)	23.1 $\pm$ 4.53	18.4 $\pm$ 3.45	<0.001*
<b>5-year overall survival</b>			
Stage II	28 (87.5%)	8 (61.5%)	0.048*
Stage III	15 (60.0%)	9 (50.0%)	0.514
Overall	43 (75.4%)	17 (54.8%)	0.046*
<b>5-year disease-free survival</b>			
Stage II	17 (60.7)	4 (50.0%)	0.892
Stage III	7 (46.7%)	3 (33.3%)	0.831
Overall	24 (55.8%)	7 (41.2%)	0.307



**Fig. 1:** Post-op specimen of transverse colectomy

with obstructing (OR) group having CEA levels of  $7.86 \pm 3.57$  while as nonobstructing (NOR) group had CEA levels of  $7.64 \pm 3.56$  which was statistically insignificant.



**Fig. 2:** Specimen of sigmoidectomy done in patient of sigmoid carcinoma

Obstructing tumors tend to be bulky and usually are of advanced stage. We observed that there was a significant difference in transmural extension of tumor between obstructing and nonobstructing lesions. In our study, OC group tumors had transmural thickness or transluminal size of about  $7.8 \pm 0.817$  cm as compared with  $6.1 \pm 0.753$  cm in NOC group. In the study of rectal patients, similar observations were found with OR group tumors having thickness of  $7.1 \pm 2.16$  cm as compared with  $4.8 \pm 1.93$  cm in NOR group. As we are all aware that malignant large BO can involve any part of large gut (colon and rectum), however, the risk varies according to the location. In our study, the majority of obstructing lesions were located on Lt side of colon with 37.5% in descending colon ( $n = 15$ ) and 50% in sigmoid colon ( $n = 20$ ) of the total OC group patients ( $n = 40$ ). There was a significant difference in the distribution of lesions with 41.3% of tumors occurring in ascending colon, 6.7% in descending colon, 12.5% in transverse colon, 33.7% in sigmoid colon and 5.8% in cecum in nonobstructing group as compared with 2.5% in ascending colon, 37.5% in descending colon, 10.0% in transverse colon, 50.0% in sigmoid colon in study patients of obstructing group. This distribution was somewhat similar to that reported by Atsushi et al.<sup>6</sup> Obstructive lesions usually suggest more advanced disease. In our study with regards to TNM staging, obstructive group had higher proportion of patients in stage III as compared with stage II, 57.5% in OC vs 46.2% in NOC and 58.1% in OR vs 43.9% in NOR, respectively, The findings were consistent with those reported by Yang Zuli et al.<sup>7</sup>

### Short-term Outcomes

One of the objectives of our study was focused on immediate post-op complications developing in the postoperative period. As we all know that the immediate post-op complications after a colorectal procedures can be a significant cause of morbidity and mortality, so all attempts need to be made at all levels of research, technical modalities and optimization to decrease these complications (Fig. 3).

Regarding immediate post-op complications except for SSI, there was no significant difference between the two groups. SSI was reported in 32.5% ( $n = 13$ ) in OC group vs 10.6% ( $n = 11$ ) in NOC group ( $p$ -value = 0.003) and in 29.0% ( $n = 9$ ) in OR group vs 8.8% ( $n = 5$ ) in NOR group ( $p = 0.029$ ). This can be attributed to the emergent nature of surgery in the obstructive group where high



**Fig. 3:** Image of post-surgery SSI in an obstructing carcinoma patient

possibilities of breach of sterility is present. In addition to emergent nature of surgery, another factor which was found in our study was low pre-op albumin levels in obstructive group as compared with NOC group which can further hamper the normal wound healing.

The other complications studied included respiratory infections which were noted in 22.5% ( $n = 9$ ) in OC group vs 15.4% ( $n = 16$ ) in NOC group ( $p = 0.312$ ) and in 19.4% ( $n = 6$ ) in OR group vs 12.3% ( $n = 7$ ) in NOR group ( $p = 0.729$ ), Post-op ileus in 7.5% ( $n = 3$ ) in OC group vs 5.8% ( $n = 6$ ) in NOC group ( $p = 0.701$ ) and in 6.5% ( $n = 2$ ) in OR group vs 5.3% ( $n = 3$ ) in NOR group ( $p = 0.818$ ). In rectal cases, there was a good proportion of patients having urinary retention, which was found in 16.10% ( $n = 5$ ) in OR group vs 12.3% ( $n = 7$ ) in NOR group ( $p = 0.615$ ). Our study was not able to correctly determine the anastomotic leaks in the two groups as most of the cases had covering stomas. Anastomotic leak was seen in very low proportion of patients (7.5%) in OC group vs 3.8% in NOC group. The findings of our study were close to that reported by Sebastiano Biondo et al.<sup>8</sup> and Lee CHA et al.<sup>9</sup> in their research. With regards to the hospital stay, the average duration of hospital stay in the OC group was  $10.9 \pm 2.65$  days, and in the NOC group, it was  $8.4 \pm 3.12$  days post-surgery. In rectal cases, it was  $12.7 \pm 2.35$  days in OR group as compared with  $9.2 \pm 2.87$  days in NOR group and were significantly different ( $p < 0.001^*$ ).

### Oncological Outcome

As far as oncological outcome is concerned, R0 resection is one of the most important prognostic factors for any malignancy including colorectal malignancy. Our study showed a significant difference in the type of resection between obstructive and NOC groups. NOC groups had higher proportion of R0 resection as compared with obstructive groups. R0 resection was found in 97.1% ( $n = 101$ ) in NOC vs 85.0% ( $n = 34$ ) in OC group with  $p = 0.021^*$  and 96.5% ( $n = 55$ ) in NOR vs 80.6% ( $n = 23$ ) in OR group with  $p = 0.037^*$ . Our results were consistent with previously reported studies. Yang Zuli et al.<sup>7</sup> We observed a significant difference in the number of lymph nodes harvested during curative resection in both the groups. Our study showed a better lymph node harvest in nonobstructing group compared with obstructing study patients. Our study had lymph node retrieval of  $19.8 \pm 4.17$  nodes in NOC group as compared with  $16.1 \pm 3.84$  lymph nodes in OC group with a  $p$ -value

of  $< 0.001^*$ , In rectal cases  $17.6 \pm 4.26$  nodes were harvested in the NOR group as compared with  $15.1 \pm 4.14$  nodes in the OR group with a  $p$ -value of  $0.003^*$  which was statistically significant. The same findings were reflected in a retrospective study done by Azin A et al.<sup>10</sup> and Andrej Nikolovski et al.<sup>11</sup>

### Long-term Outcome

Long-term outcomes in colorectal malignancies is determined in terms of recurrence, overall, 5 year survival and disease-free survival. In our study, the total recurrence rate of CRC was 28.8% ( $n = 67$ ). We found an overall recurrence rates of 26.38% ( $n = 38$ ) in colonic malignancies and 32.9% ( $n = 29$ ) in rectal cancers. Our study showed higher incidence of recurrence in obstructing groups as compared with nonobstructing groups (35% in OC vs 23.1% in NOC and 38.7% in OR vs 29.8% in NOR) with the results being not statistically significant. With regards to site of recurrence, our study showed a significant difference in pattern of recurrence, with more of local recurrence as compared with distant recurrence in obstructive groups than NOC groups. OC group had a local recurrence of 64.3% ( $n = 9$ ) as compared with NOC group where it was seen in 29.2% ( $n = 7$ ). Similar patterns were noted in rectal cancers with OR group having local recurrence in 66.7% ( $n = 8$ ) of patients as compared with 29.4% ( $n = 5$ ) in NOR group. Further, the results of our study showed that the median interval for recurrence was early in obstructive group in comparison with NOC group. It was  $20.4 \pm 3.67$  months in OC group vs  $26.1 \pm 4.16$  months in NOC group ( $p < 0.001^*$ ) and  $18.4 \pm 3.45$  months in OR group vs  $23.1 \pm 4.53$  months in NOR group ( $p < 0.001^*$ ). Higher incidence of local recurrence in obstructive groups can be attributed to lower proportion of R0 resection found in these obstructive lesions. Our study showed better outcomes with less recurrence rates than that reported by Yang Zuli et al.<sup>7</sup>

Colorectal cancer survival is principally a function of the stage of the disease at diagnosis, the earlier the stage at diagnosis, the better the survival. Obstructive CRC patients receiving emergency procedures have significantly worse overall 5-year survival than NOC CRC patients receiving elective procedures. Our study showed the overall 5-year survival rates of 77.9% and 75.4% in the NOC and NOR groups, respectively, compared with 60.0% and 54.8% in the OC and NOC groups, respectively. On stage-for-stage analysis for survival, our study found that the overall 5-year survival rates for stage II CRC were 89.3 and 64.7% in the NOC and OC groups, respectively ( $p = 0.017^*$ ) as compared with 87.5 and 61.5% in the NOR and OR groups, respectively ( $p = 0.048^*$ ). With regards to stage III patients, the overall 5-year survival rates were 64.6% and 56.5% in NOC and OC groups, respectively ( $p = 0.512$ ) as compared with 60 and 50% in NOR and OR groups, respectively ( $p = 0.514$ ). In our study compared with the NOC group, the obstructive group had a worse 5-year overall survival rate.

The results of our study showed similar patterns in 5-year disease-free survival rates with 60.5 vs 45.8% of study patients having 5-year disease-free survival in the NOC and OC groups, respectively ( $p = 0.203$ ), and that of rectal cancers, it was 55.8 vs 41.2% in the NOR and OR groups, respectively ( $p = 0.307$ ). Compared with the NOC group, the obstructive group had a worse 5-year disease-free survival rate but the difference was not statistically significant.

Furthermore, stages II and III 5-year disease-free survival were 54.5 and 38.5%, respectively in OC group compared with

64.0 and 54.8% in NOC group. In rectal carcinoma study patients, stages II and III 5-year disease-free survival were 50.0 and 33.3%, respectively in obstructing group compared with 60.7 and 46.7% in nonobstructing group. The results of our study were slightly better compared with the published results of study done by Yang Zuli et al.<sup>7</sup> Franklyn J et al.<sup>3</sup>

## CONCLUSION

On comparing survival outcome of patients who had completed multi-modal therapy in both groups, there was significantly better outcome for patients who have presented without obstruction, implying that poor prognosis may be a result of un-favorable factors, such as poorly differentiated histology, stage of presentation, R1 resection, less nodal harvest, higher recurrence rates which were profoundly present in the obstructing groups contributing to their poorer survival as compared with nonobstructing groups. The limitations of our study would be the fact that our center being a referral center of our state, patients are usually referred at a later stage which may account for the large number of patients presenting with obstruction. This would make generalization of our study results a little difficult. Active follow-up of patients during cancer therapy may prevent attrition during the treatment process and improve adherence to treatment and in the long run improve cancer survival.

## Ethical Clearance

Our study's ethical approval was sought from the Institutional Ethical Committee (IEC), Skims. Under the reference number RP-B 131/2020.

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