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## Colorectal Carcinoma, Extent and Spread in our Population. Resection Specimens give Valuable Information

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### Abstract

**Objective:** To acquire information about the extent and spread of colorectal carcinomas in our population by examining colon and colorectum resection specimens received.

**Methods:** All colon and colorectum resection specimens received in the section of Histopathology, Aga Khan University Hospital, Karachi from January 1, 2003 to July 31, 2003 were included in the study.

**Results:** Eighty five resection specimens were received during the study period, 69.41% patients were males, and 30.59% were females. The mean age for males was 49 years and for females 48 years. Tumor location was in left colon (58.82%), and in right colon (41.18%). The average size of the lesions in largest dimension was 5.5cms. Majority (83.53%) were colorectal adenocarcinomas, 71.76% cases were grade II, 16.47% were grade I, and 11.76% were grade III. Most cases (85.88%) infiltrated full thickness of the bowel wall extending into the pericolonic fat. Vascular invasion was seen in 16.47% cases. Radial margin was positive in 23.08% of rectal carcinomas and 57.65% cases showed lymph node metastases.

**Conclusion:** The findings in our study demonstrate that the disease is usually very advanced with extension into pericolonic fat and positive lymph nodes. Thus, the early detection and resection (while the disease is still in an early stage) are essential in our population using better surgical techniques, for proper staging of these tumors (JPMA 55:483;2005).

### Introduction

A colon or colorectal resection specimen can give extensive and important information about colorectal carcinoma. When a pathologist receives a specimen, certain tumor parameters must be reported to give adequate information to the clinician. These parameters not only give the requisite information to the clinician but they are also invaluable in providing us precious data about these common cancers. These include the location of the tumor, its macroscopic appearance and size, type of cancer (whether typical or some variant such as mucinous, signet-ring, neuroendocrine etc), grade of the cancer, depth of penetration in the bowel wall, presence or absence of vascular and perineurial invasion, status of resection margins, status of lymph nodes whether involved or not as well as the number of involved lymph nodes, and the stage.<sup>1</sup>

Western data shows that approximately 40-50% of all colorectal carcinomas occur in the rectosigmoid, and the sigmoid colon alone accounts for another 25%.<sup>2,3</sup> In one large study, lesions in the proximal left colon had the best prognosis whereas the rectosigmoid cancers had the worst prognosis.<sup>4</sup> Another study has shown a shift in location in the past few decades towards the proximal colon.<sup>5</sup>

The aim of this study was to acquire information about the extent and spread of colorectal carcinomas in our population by examining colon and colorectum resection specimens received.

### Material and Methods

A case series of all colon and colorectum resection specimens received in the Section of Histopathology, Aga Khan University from January 1, 2003 to July 31, 2003 were analysed. All specimens were fixed in 10% buffered formalin and allowed to stay overnight. Specimens were grossed and representative sections were taken according to established protocols. In particular, meticulous and thorough search was made for lymph nodes, and if required, the specimen was revisited if yield of lymph nodes at the time of initial grossing was unsatisfactory. The sections were routinely processed under standardized conditions for paraffin embedding. Sections were then cut and stained with hematoxylin and eosin using a standard procedure. When required special stains such as acid mucin and immunohistochemical stains were employed. The reporting of the cases was done using a standard format incorporating all the relevant parameters.

Data was analysed using SPSS version 12.5 and frequencies were calculated.

### Results

During the study period, 85 resection specimens for cases of colorectal carcinoma were received, 59 patients (69.41%) were males, and 26 (30.59%) were females. Age range for males was 17 years to 84 years with a mean of 49 years. Age range for females was 13 years to 80 years with

a mean of 48 years. Tumor was located in the left colon in 50 cases (58.82%), and in the right colon in 35 cases (41.18%). Of the 50 cases in the left colon, 18 were located in the rectum and another 8 in the recto sigmoid. Together, these 26 cases comprised 52% of left sided tumors and 30.59% of all tumors.

Gross appearance was polypoid (fungating) (54.12%), and ulcerative/infiltrating in (54.12%) cases. The size of the lesions varied from 2.0 cms to 14.0 cms in the largest dimension with an average size of 5.5 cms.

A large number of cases (83.53%) were typical colorectal adenocarcinomas. There were eight cases of mucinous carcinoma (9.41%), four cases of signet ring carcinoma (4.70%), and two cases, of neuroendocrine carcinoma (2.35%). Seven patients with mucinous carcinoma were males (87.5%). Four (50%) out of eight mucinous carcinomas were located in the rectum or recto sigmoid, while the other four were located in the right colon. Three out of four patients with signet ring carcinomas were males aged 17, 20 and 22 years, while the fourth patient was a 35 year old female. Three of the four cases of signet ring carcinoma were located in the rectum, while the fourth case was located in the cecum. In our study, 61 out of 85 cases (71.76%) were grade II, 14 (16.47%) were grade I, and 10 (11.76%) were grade III.

Majority of the cases in our study (85.88%) infiltrated the full thickness of the bowel wall, extending beyond the outer border of the muscularis propria into the serosal fat. Vascular invasion was present in 16.47% while perineurial invasion was present in 2 cases 2.35% cases. Peripheral (proximal and distal) resection margins were clear in almost all (98.8%) cases. In one case, the distal resection margin was involved. However, 6 out of 26 cases (23.08%) of rectal and rectosigmoid carcinomas showed positive radial margin. In another case, the tumor was less than 2 mm from the radial margin.

**Table. TNM staging of colorectal carcinomas in our study.**

	n = 85		n = 85*		
		%age		%age	
T1	1	(1.18%)	N0	35	(41.18%)
T2	11	(12.94%)	N1	23	(27.06%)
T3	71	(83.53%)	N2	26	(30.59%)
T4	2	(2.35%)			

\*In one case, no lymph nodes were identified.

Lymph node metastases were seen in 57.65%, 35 cases (41.17%) showed no nodal metastases, while in one case (1.18%), no lymph nodes were identified. In 49 cases

positive for nodal metastases, 13 (26.53%) had 1 positive lymph node, 18 (36.73%) cases had 2-5 positive nodes, 10 (20.41%) had 6-10 positive nodes, and 8 cases (16.37%) had greater than 10 positive nodes.

The TNM system<sup>6</sup> for staging was used to classify all cases. (Table) Five cases were M1, while in the remaining cases, information about distant metastases was not available (Mx).

## Discussion

In our study, mucinous carcinomas are comparable to Western data, whereas signet ring carcinomas are rare<sup>3</sup> in the west. Mucinous carcinomas especially those occurring in the rectum have a somewhat poor prognosis than the conventional type of adenocarcinoma.<sup>7-9</sup> Studies have shown that colorectal carcinomas in very young and very old have a poor prognosis.<sup>10</sup> In the very young, this is probably due to greater delay in diagnosis leading to more advanced stage, and greater number of signet ring and mucinous tumors.<sup>11,12</sup>

Various studies have shown a definite relationship between the microscopic grade of the tumor and its prognosis.<sup>10,13</sup> According to the Western literature, 15-20% colorectal carcinomas are grade I (well differentiated), 60-70% are grade II (moderately differentiated), and another 15-20% are grade III (poorly differentiated).<sup>14</sup> Findings of our study correspond roughly to the Western data.

Prospects for cure are reduced and lymph node metastases are more common once the tumor has spread beyond the outer border of muscularis propria into the serosal (pericolonic) fat.<sup>4</sup> A study showed that the cumulative probability of survival at five years in tumors confined to the bowel wall was 97.7% regardless of the presence of lymph node metastases.<sup>14</sup> In our study, a large number cases showed extension into pericolonic fat.

The presence of vascular invasion causes a marked decrease in the five year survival rate.<sup>15,16</sup> Perineurial invasion is also usually a sign of advanced disease.<sup>3,15</sup> Except for one case, all cases with vascular or perineurial invasion were full thickness lesions extending into serosal fat with positive lymph nodes i.e all these cases were advanced stage lesions.

In our study positive radial margins were present in 23.08% cases of rectal and colorectal lesions. A positive radial margin in rectal carcinoma may be the single most critical factor for predicting local recurrence.<sup>17</sup> Also, the risk of local recurrence in rectal carcinoma is higher if the tumor is less than 2mm from the radial margin.<sup>18</sup>

The presence of lymph node metastases in a resection specimen for colorectal carcinoma greatly worsens prognosis and the five year survival rate drops sharply.<sup>3,4</sup> A large

series showed that the five year survival rate was reduced to 32% in lymph node positive cases, while it was 83.7% for lymph node negative cases.<sup>19</sup> Also, the greater the number of lymph nodes involved, the worse the prognosis. The same study<sup>19</sup> also showed that the five year survival rates were 63.6%, 36.1%, 21.9% and 2.1% respectively for one positive lymph node, two to five positive nodes, six to ten positive nodes, and more than ten positive nodes. Other more recent studies have reaffirmed the findings of this classic study.<sup>20,21</sup> Due to the great prognostic significance of nodal metastases, meticulous lymph node examination is critical. Various studies have reported that a minimum of thirteen to seventeen lymph nodes must be recorded from a colorectal resection specimen.<sup>22-25</sup>

In our study, more than half the cases showed lymph node metastases. In the lymph node positive cases, 36 (73.47%) had two or more positive nodes which significantly worsens the prognosis as compared to when only a single node is involved.<sup>19</sup>

It must be noted that in a number of the 35 cases in our study with negative nodes, the number of recovered lymph nodes was less than thirteen despite meticulous and thorough search for lymph nodes on gross examination. This indicates that the actual percentage of lymph node positive cases in our setting may be higher than shown in this study. These problems were encountered more in resection specimens received from smaller cities of the country. Even in cases with positive nodes, the numbers of recovered lymph nodes was often less than thirteen after meticulous gross examination. Again, this indicates that even in the lymph node positive cases, the actual number of positive nodes may be higher than what is shown in this study.

The findings in our study demonstrate that in the large majority of colonic and colorectal carcinomas in our population, the disease is usually very advanced with extension into pericolic fat and positive lymph nodes. We do not have data about distant metastases, but there is no doubt that a significant percentage of these cases will be positive for distant metastases i.e. M1. Thus, the early detection and resection (while the disease is still in an early stage) are essential in our population using better surgical techniques so that adequate lymph nodes can be recovered for proper staging of these tumors.

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