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LOWER GASTROINTESTINAL TRACT TUMORS WITH EMERGING BLUE HUES

Oncology

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ABSTRACT

According to International Agency For Research On Cancer (IARC), Colorectal cancer (1.8 million cases,10.2% of the total) is the third most commonly diagnosed cancer. Cancers of colorectum are ranked second in terms of mortality. Gastrointestinal tract specimens hold specific importance not only for specific diagnosis of the neoplasms but also for understanding the severity and staging of these neoplasms. WHO classification of tumors of digestive system, 5th edition helps in diagnosing and assessing the prognosis of these tumors.

AIM AND OBJECTIVES: 1. To study the spectrum of neoplastic lesions of the lower gastrointestinal tract by examination of surgically resected specimens in our tertiary care hospital 2. To determine age and sex wise distribution of these neoplasms 3. To determine the degree of severity of the malignancies by assessing the depth of invasion, lymph node spread, distant metastasis. 4. To determine the distribution of these neoplasms in different sites of the lower gastrointestinal tract.

MATERIALS AND METHODS: The present study was carried out over a period of 2 years from June 2016 to May 2018. This is a prospective study of 60 intestinal specimens received in our Tertiary Care Hospital in the surgical pathology department.

CONCLUSIONS: To conclude, colorectal adenocarcinomas are the most common carcinomas of the lower gastrointestinal tract with the peak incidence in the 6th decade and female preponderance. However, the rarer histopathologic types must be kept in mind (example gastrointestinal stromal tumor, lymphomas and neuroendocrine neoplasms). Patients with mixed dietary habits were more prone of carcinomas of the lower gastrointestinal tract than non-vegetarian diet.

KEYWORDS

Neoplasms, lower gastrointestinal tract, WHO, staging

INTRODUCTION:

According to International Agency For Research On Cancer (IARC), Colorectal cancer (1.8 million cases,10.2% of the total) is the third most commonly diagnosed cancer. Cancers of colorectum are ranked second in terms of mortality. Gastrointestinal tract specimens hold specific importance not only for specific diagnosis of neoplasms but also for understanding the severity, staging of these neoplasms. WHO classification of tumors of digestive system, 5th edition helps in diagnosing and assessing the prognosis of the lesions. WHO classification of tumors of digestive system is the first volume of fifth edition of the WHO blue books. The content of book follows the normal progression from benign to malignant, tumor types common to multiple systems are dealt with together.

MATERIALS AND METHODS:

The present study was carried out over a period of 2 years from June 2016 to May 2018. This is a prospective study of 60 intestinal specimens received in our Tertiary Care Hospital in the surgical pathology department. All surgically resected intestinal specimens received for histopathological examination and diagnosed as neoplasm were included in the study. Gross and light microscopic examination was done. Special stains and immunohistochemistry was done wherever needed. The diagnosis, typing of tumors was done following the latest guidelines of WHO. Staging of tumors was done according to the recent protocol (8th edition) by the College of American Pathologists (CAP).

RESULTS:

Table I- Anatomical Distribution Of Specimens

SITE	NUMBER	PERCENTAGE
Small intestine	8	13 %
Ileocaecal junction	8	13 %
Large intestine	42	71 %
Anal canal	2	3 %
TOTAL	60	100 %

Table II- Age Wise Distribution Of Benign And Malignant Tumors

Age Group (Years)	Benign Tumors		Malignant Tumors	
	No. Of Cases	Percentage	No. Of Cases	Percentage
0-10	0	0 %	0	0 %
11-20	2	40 %	1	2 %
21-30	2	40 %	4	7 %
31-40	0	0 %	12	22 %
41-50	1	20 %	12	22 %
51-60	0	0 %	7	13 %
61-70	0	0 %	14	25 %
71-80	0	0 %	4	7 %
81-90	0	0 %	1	2 %
91-100	0	0 %	0	0 %
TOTAL	5	100 %	55	100 %

Table III – Sex Wise Distribution Of Cases

SEX	NUMBER OF CASES	PERCENTAGE
MALE	29	48 %
FEMALE	31	52 %
TOTAL	60	100 %

Table IV– WHO Categories Of Colorectal Tumors

WHO CATEGORY	NUMBER OF CASES	PERCENTAGE
EPITHELIAL	55	92 %
MESENCHYMAL	2	3 %
LYMPHOMA	3	5 %
TOTAL	60	100 %

Table V– Incidence Of Various Histopathological Types

TUMOR	NUMBER OF CASES	PERCENTAGE
ADENOCARCINOMA	35	57 %
MUCINOUS ADENOCARCINOMA	13	22 %
NON-HODGKIN'S LYMPHOMA	3	4 %
NEUROENDOCRINE TUMOR	1	2 %
MIXED NEUROENDOCRINE NON-NEUROENDOCRINE NEOPLASM	1	2 %
BENIGN GIST	1	2 %
MALIGNANT GIST	1	2 %
SIGNET RING CELL CARCINOMA	1	2 %
PEUTZ-JEGHER POLYP	2	3 %
JUVENILE POLYP	1	2 %
ADENOMATOUS POLYPOSIS COLI	1	2 %
TOTAL	60	100 %

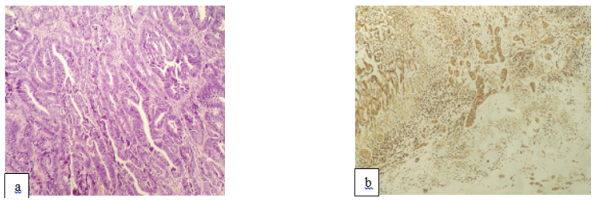

Figure 1: a) Photomicrograph of well-differentiated adenocarcinoma of colon [H&E,10X] b) Photomicrograph of immunohistochemical stain for adenocarcinoma showing tumor cell positivity for cytokeratin-20 [10X]

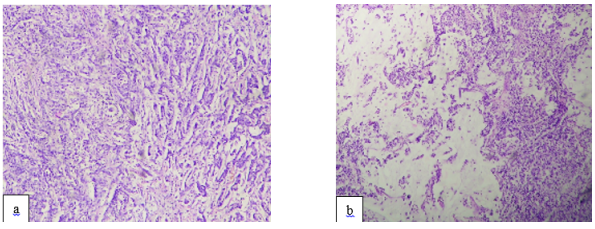

Figure 2: a) Photomicrograph of mucinous adenocarcinoma showing tumor cells floating in pools of extracellular mucin[H&E,10X] b) Photomicrograph of Signet ring cell carcinoma showing signet ring cells floating in pools of extracellular mucin [H&E,10X]

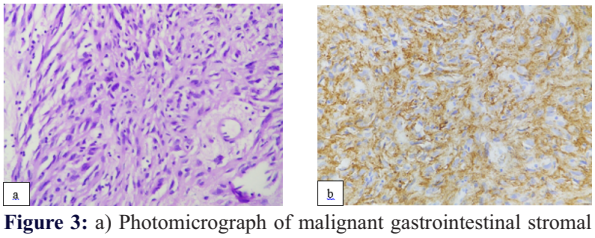

Figure 3: a) Photomicrograph of malignant gastrointestinal stromal tumor comprised of proliferating spindle cells showing pleomorphism and frequent mitotic figure [H&E,10X] b) Photomicrograph of gastrointestinal stromal tumor showing diffuse cytoplasmic positivity for DOG1 [DOG1,10X]

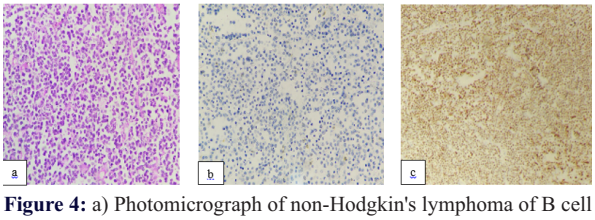

Figure 4: a) Photomicrograph of non-Hodgkin's lymphoma of B cell type showing monomorphic population of small, round tumor cells having high nuclear cytoplasmic ratio[H&E,10X] b) Photomicrograph of non-contributory CD-3 of non-Hodgkin's lymphoma of B cell type[CD3, 10X] c) Photomicrograph of Ki-67 marker for non-Hodgkin's lymphoma B cell type[Ki-67, 10X]

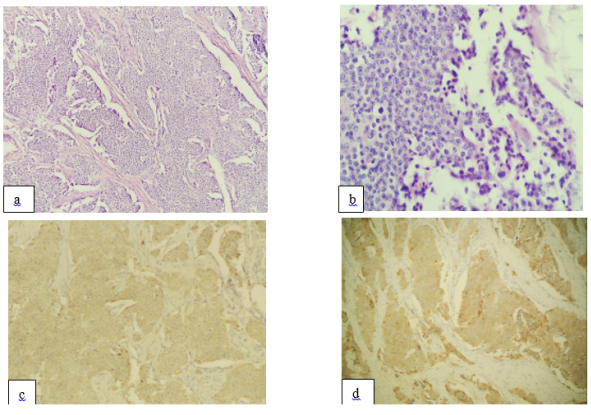

Figure 5: a) Photomicrograph of neuroendocrine carcinoma showing tumor arranged in nests, syncytium separated by fibrous septa[H&E,10X] b) Photomicrograph of neuroendocrine carcinoma showing round to oval nuclei with characteristic salt-pepper type chromatin[H&E, 40X] c) Photomicrograph of neuroendocrine carcinoma showing positivity for chromogranin [Chromogranin,10X] d) Photomicrograph of synaptophysin stain of neuroendocrine carcinoma showing membranous positivity.[Synaptophysin,10X]

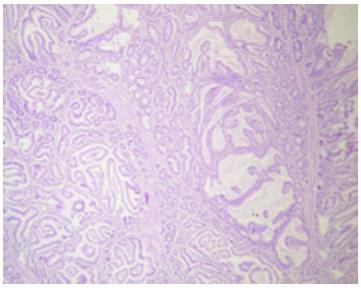

Figure 6: Photomicrograph of Peutz-Jegher polyp showing typical arborizing pattern [H&E,10X]

Table VI – Gross Appearance Of Tumors

GROSS APPEARANCE	NUMBER OF CASES	PERCENTAGE
ULCEROPROLIFERATIVE	26	42 %
ULCEROINFILRATIVE	15	25 %
POLYPOIDAL	4	7 %
NODULAR	7	12 %
STRICTURE	7	12 %
FUNGATING	1	2 %
TOTAL	60	100 %

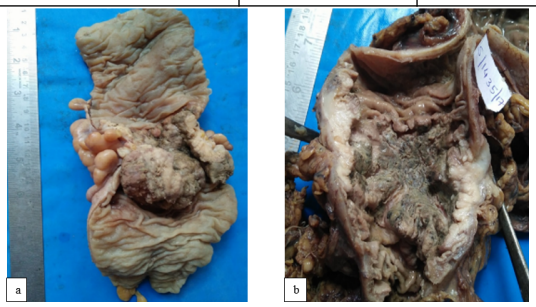

Figure 7: a) Gross specimen of adenocarcinoma of ascending colon showing an ulceroproliferative growth. b) Gross specimen of adenocarcinoma of sigmoid colon showing an ulceroinfiltrative growth

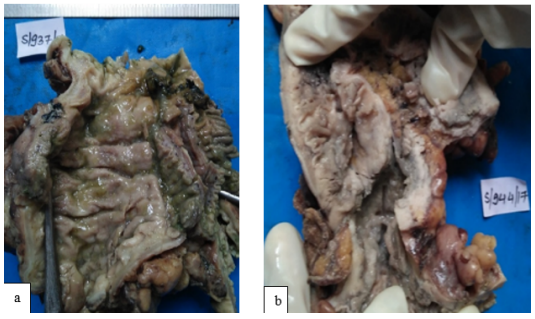

Figure 8: a) Gross specimen of mucinous adenocarcinoma of the descending colon. Cut surface is showing mucinous areas. b) Gross specimen of descending colon showing stricturous growth. The cut surface shows greyish white tumor with firm areas.

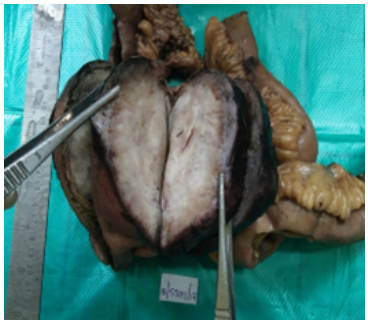

Figure 9: Gross specimen of gastrointestinal stromal tumor showing well circumscribed, bosselated tumor.

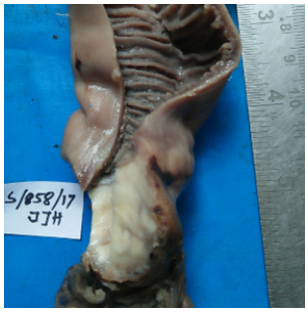

Figure 10: Gross specimen of non-Hodgkin's lymphoma showing greyish white homogenous tumor.

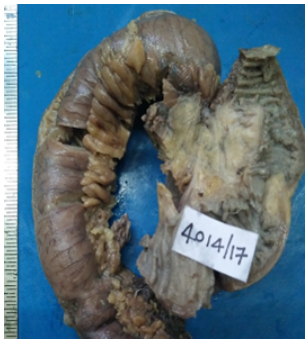

Figure 11: Gross specimen of Mixed neuroendocrine non-neuroendocrine neoplasm of colon showing greyish white tumor.

Table VII – Percentage Of Tumors With Metastasis

METASTASIS	NUMBER OF CASES	PERCENTAGE
PRESENT	15	25 %
ABSENT	45	75 %

Table VIII- Depth Of Invasion By Tumors

Site	Submucosa	Muscularis Propria		Serosa		Total
		No.	%	No.	%	
Small intestine	0	1	25 %	3	75 %	4
Ileocaecal junction	0	5	63 %	3	37 %	8
Large intestine	0	27	64 %	15	36 %	42
Anal canal	0	0	0	2	100 %	2

Table IX- TNM Staging Of Colorectal Tumors

STAGE	NUMBER OF CASES	PERCENTAGE OF CASES
T2N0M0	5	10 %
T2N1a M0	2	4 %
T3N0M0	26	50 %
T3N1a M0	5	10 %
T3N1b M0	1	2 %
T3N2a M0	2	4 %
T3N2b M0	1	2 %
T4a N0M0	6	11 %
T4b N0M0	1	2 %
T4a N1a M0	3	5 %
TOTAL	52	100 %

Table X- AJCC Staging Of Colorectal Tumors

STAGE	NUMBER OF CASES	PERCENTAGE OF CASES
I	9	16 %
IIA	25	45 %
IIB	5	9 %
IIC	1	2 %
IIIA	3	5 %
IIIB	11	19 %
IIIC	1	2 %
IVA	1	2 %
TOTAL	56	100 %

Table XI- Modified Astler Coller Staging Of Colorectal Tumors

STAGE	NUMBER OF CASES	PERCENTAGE
A	0	0 %
B1	5	10 %
B2	29	59 %
B3	1	2 %
C1	2	4 %
C2	12	25 %
D	0	0 %
TOTAL	49	100 %

DISCUSSION:

The finding of the present study is concordant with the study of Goswami et al[1] that epithelial tumors are more common followed by mesenchymal. In our study, we found that peak age of incidence is 4th-6th decade while Ritesh sulegaon et al, 2015[2] have proved that the peak age of incidence in the 4th-6th decade. The present study shows a female predominance with the female to male ratio of 1.06:1. The finding is similar to another study by Mohammad et al,2006[3]. The anatomical distribution of colorectal tumors in the present study was found to be in conformity with the other studies by Dadhania et al,2016[4] and Saiprasad et al,2015[5]. The findings of the present study are in concordance with that of Saiprasad et al,2015[5] with adenocarcinoma being the most common subtype followed by mucinous adenocarcinoma and non-Hodgkin's lymphoma.

We correlated all our findings with WHO classification of tumors of digestive system, 5th edition[6]. In this blue book, certain tumor types are defined as much by their molecular phenotype as their histological characteristics, however, histopathological classification remains the gold standard for diagnosis in most instances.

Transition scheme for the new classification including previous definitions of neuroendocrine neoplasms:

WHO 1980	WHO 2000	WHO 2010	WHO 2019
1) Carcinoid	1) Well-differentiated endocrine tumor(WDET) 2) Well-differentiated endocrine carcinoma (WDEC) 3) Poorly differentiated endocrine carcinoma/small cell carcinoma (PDEC)	1) NET G1 (carcinoid) 2) NET G2 3) NEC (large cell or small cell type)	1) NET G1 2) NET G2 3) NET G3
2) Mucocarcinoid 3) Mixed forms of carcinoid-adenocarcinoma	4) Mixed exocrine-endocrine carcinoma (MEEC)	4)Mixed adenoneuroendocrine carcinoma (MANEC)	4)NEC, small cell type (SCNEC) NEC, large cell type (LCNEC)
5) Pseudotumour lesions	5)Tumour like lesions (TLL)	5) Hyperplastic and preneoplastic lesions	5) MiNEN

CONCLUSION:

To conclude, colorectal adenocarcinomas are the most common carcinomas of the lower gastrointestinal tract with the peak incidence in the 6th decade and female preponderance. However, the rarer histopathologic types must be kept in mind (example gastrointestinal stromal tumor, lymphomas and neuroendocrine neoplasms). Patients with mixed dietary habits were more prone of carcinomas of the lower gastrointestinal tract than non-vegetarian diet.

2019 WHO classification of digestive system tumors will play a pivotal role in diagnosis of these tumors with specific highlights on molecular markers for confirmation of diagnosis, biological behavior, outcome and treatment. However, histopathology remains gold standard for diagnosis.

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