

*Original Research Article*

Interpretation of Neoplasms of Lower GI Tract -A 5 Year's Research Study

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ABSTRACT

Malignant neoplasms are uncommon in the small intestine, constituting only 20% of all the gut tumors. Males and increasing age have a higher predilection for these malignancies. The peak incidence of colorectal carcinoma is between 60-70 years of age. Squamous cell carcinoma (SCC) is the most common neoplasm of the anal canal and is frequently associated with chronic HPV infection. Pathologic examination of biopsy, polypectomy and resection specimens is crucial to appropriate patient management, prognosis assessment and family counseling.

Aim & Objectives: To study the spectrum of neoplastic lesions of the lower gastrointestinal tract by the examination of surgically resected specimens. To determine the degree of severity of the malignancies by assessing the depth of invasion, Lymph nodal & Omental spread.

Methods: The present study is both retrospective & prospective study for a period of 5 years from January 2007 to December 2011. The sample size includes all the surgically resected specimens of lower gastrointestinal tract received at Department of Pathology, S.V. Medical College, Tirupati. The biopsy specimens thus obtained were fixed in 10% buffered neutral formalin. The sections were stained routinely with H & E. Special stains and IHC done wherever necessary.

Results: we have received 1675 surgically resected specimens regarding the lower gastrointestinal system. Among these 1675 specimens, a total 64 neoplasms were analyzed, in which 55(86%) were malignant and 9 (14%) were benign lesions. Most common site was Large intestines (73%), followed by small intestine (18.8%), anal canal (4.7%) and appendix (3%). In the small intestine 3 (25%) were adenomas, 3 were (25%) Malignant lymphomas, a single case was Gastrointestinal stromal tumor & 5 (41.7%) were Adenocarcinoma & its variants. Out of 47 tumors of Large intestine 5 (10.6%) were Adenomas & 42 (89%) were Adenocarcinoma & its variants. In Anal canal there were 2 (66%) Squamous cell carcinomas & 1 (33%) Malignant melanoma reported. In the Appendix there were single cases (50%) each of adenocarcinoma & Mucocele were reported.

Conclusion: Most of the neoplasms were malignant. The common malignancy was Adenocarcinoma (87%) and common benign neoplasm was Adenoma (88%). Most of the malignancies occurred in large intestine (82.3%) followed by small intestine (17.6%). Maximum number of Neoplasms occurred in the age group of more than Fifty years (62%), most common in male patients. Proportion & Incidence of Malignant Lymphomas were common in Small intestines (33.3%).

Keywords: Lower GI tract, Neoplasms, Interpretation, Research study.

INTRODUCTION

Gastrointestinal (GI) tract tumors are one of the most common cancers accounting

for 11% of all cancers. [1] Lower gastrointestinal tumors include those arising from the Third part of duodenum, Jejunum,

Ileum, Cecum, Colon, Rectum & Anal canal. Apart from in Small intestine, malignant tumors are most common than benign in the rest of the GI tract. [2]

Small Intestine: Although the small bowel represents 75 % of the length of the alimentary tract, tumors account for only 3-6% with slight predominance of benign tumors. Incidence of Malignant tumors of the small intestine is less than 1.0 per 100,000 populations. In general, small intestinal cancers have a low prevalence in Asian countries as compared to the West. In industrialized countries, adenocarcinomas occur most often. In developing countries, lymphomas are much more common. Hereditary nonpolyposis colorectal cancer patients have a high likelihood of developing adenocarcinoma of the small bowel. [3] Environmental factors such as a diet rich in red meat, salt-cured or smoked foods, as well as intake of tobacco and alcohol, have been implicated in the etiology of this malignancy. [4] Predisposing medical conditions are Crohn's disease and celiac disease (Nontropicalsprue). Patients suffering from Crohn's disease have a high risk of developing adenocarcinoma of the small bowel; whereas patients suffering from celiac disease have increased risk of developing small bowel lymphoma rather than adenocarcinoma. [5] Lymphomas constitute a significant proportion (30-50%) of all malignant tumors. The small intestine is the main site for metastatic tumors in the gastrointestinal tract. Small bowel cancers are asymptomatic in the early stages. As the disease progresses, symptoms develop. The nature of symptoms is nonspecific and, as a result, there is a delay in diagnosis which averages 6-8 months. [6] The most common malignant tumors are Adenocarcinoma & carcinoid, followed in order by gastrointestinal stromal tumor and malignant lymphoma. [7] Carcinomas of Small intestine may be polypoid, infiltrating or stenosing. Jejunal and ileal carcinomas are usually

relatively large, annular, constricting tumors with circumferential involvement of the wall of the intestine. Most of the carcinomas penetrate the muscularispropria and involve the serosal surface at the time of presentation.

Appendix: Primary neoplasms of the vermiform appendix are presented in approximately 0.5-1% of appendectomy specimens and generally affect adults. Carcinoid tumors are the most common neoplasm of the appendix accounting for 50-77% of all appendiceal neoplasms. Adenocarcinoma of the appendix occurs in 0.1% of appendicectomies, corresponding to an estimated incidence of 0.2/100,000 per annum. [8] In cases of primary adenocarcinoma, the appendix may be enlarged, deformed or completely destroyed. A grossly appreciated swelling of the appendix due to the accumulation of mucus within the lumen is termed as mucocoele.

Colon & Rectum: The incidence rates for adenocarcinoma of the colon are 33.7/100,000 & that of rectal adenocarcinoma is 12.8/100,000. More than 90% of colorectal carcinomas are adenocarcinomas originating from epithelial cells of the colorectal mucosa. [9] They arise as polyps and produce symptoms relatively early and at a stage generally curable by resection. The peak incidence of colorectal carcinoma is between 60-70 years of age. A high incidence of colorectal carcinomas is seen with high caloric food rich in animal fat combined with a sedentary lifestyle. [10,11]

Anal Canal: Carcinoma of Anus comprises with an incidence rate of 1.5 per 100,000 per annum. Squamous cell carcinoma (SCC) is the most common neoplasm of the anal canal & is frequently associated with chronic HPV infection. [12] SCC of the anal canal and anal margin occurs in 6th or 7th decade of life, may present as a small ulceration or fissure with slightly exophytic and indurated margins, and irregular thickening of the anoderm and anal margin with chronic

dermatitis. [13]

Malignant melanomas may be sessile or polypoid. Pigmentation of the lesion is often appreciated. Satellite nodules may also occur, Characterized by a predominantly junctional proliferation of atypical melanocytes. The tumor cells most frequently are epithelioid, and also spindle cells. [14, 15]

Adenomas are circumscribed, benign lesions, composed of tubular or villous structures showing intraepithelial neoplasia. The frequency of malignant transformation depends on size and histological grade. Flat adenomas have a greater tendency to progress to carcinoma. [16] If more than 50% of the tumor contains extracellular mucinous pools then it is termed as Mucinous Adenocarcinoma (fig-5). Tubular adenocarcinoma (fig-8), contains prominent dilated or slit like and branching tubules varying in their diameter & may also show acinar structures. Individual tumor cells are columnar, cuboidal, or flattened by intraluminal mucin (fig-9 & 10). The degree of cytological atypia varies from low to high-grade. In Signet-ring cell carcinoma more than 50% of the tumor consists of isolated or small groups of malignant cells containing intracytoplasmic mucin. The tumor cells may have Nuclei push against cell membranes creating a classical signet ring cell appearance due to an expanded, globoid, optically clear cytoplasm. Signet-ring cell carcinomas are infiltrative & the number of malignant cells is comparatively small with prominent desmoplasia. [17] Gastrointestinal stromal tumors (GIST) are spindle cell tumors resembling smooth muscle tumors histologically & grossly. [18,19] Histopathological examinations of resected specimens will aid in confirmatory diagnosis, Type of tumor, Staging & Grading of tumor and predicting the prognosis after surgical resection.

Aim & Objectives:

- To study the spectrum of neoplastic lesions of the gastrointestinal tract by the examination of surgically resected specimens received at the department of Pathology, S.V. Medical College, Tirupati.
- To determine the distribution of these neoplasms in different sites of lower GI Tract.
- To determine the age wise incidence and sex wise distribution of these neoplasms.
- To correlate the occurrence of these neoplasms with certain personal habits.
- To determine the degree of severity of the malignancies by assessing the depth of invasion, Lymph nodal & Omental spread.

MATERIALS & METHODS

The present study is both retrospective & prospective study for a period of 5 years from January 2007 to December 2011. The sample size includes all surgically resected specimens of lower gastrointestinal tract received at Department of Pathology, S.V. Medical College, Tirupati. The study also obtained clearance from the ethical committee of the institution. Brief clinical data was noted from the case records, which included the age and sex of the patients, relevant habits if any, presenting symptoms, endoscopic findings and diagnosis. The biopsy specimens thus obtained were fixed in 10% buffered neutral formalin. Surgically resected specimens are described by mentioning the site, measurement, appearance, location and size of the growth/ lesion, Number of Lymph nodes identified and their cut section. Sections were taken from resected margins, different areas of the lesion, each lymph node and omentum of 2-3 millimeters thick and subjected to tissue processing. The sections were stained routinely with Hematoxylin and Eosin. Other special stains like Periodic acid Schiff (PAS), Mucicarmine, Alcianblue and

Reticulin stains were performed wherever necessary for the additional sections. Immunohistochemistry (IHC) done for gastrointestinal stromal tumor & malignant lymphoma. The lesions were diagnosed as per WHO classification of tumors. The clinical and histological data so obtained were analyzed.

RESULTS

From January 2007 to December 2011 we have received 1675 surgically resected specimens regarding the lower gastrointestinal system. Among these 1675 specimens, a total 64 neoplasms were analyzed, among these 64 neoplasms, 55 (86%) were malignant and 9 (14%) were benign lesions. 12 (18.7%) occurred in Small intestines (Jejunum & Ileum), 47

(73.4%) occurred in Large intestines (Cecum, Colon & Rectum), 3 (4.6%) occurred in Anal canal & 2 (3.1%) occurred in Appendix. In the small intestine 12 tumors encountered among which, 3 (25%) tumors were adenomas, 3 (25%) tumors were Malignant lymphomas, a single case was Gastrointestinal stromal tumor & 5 (42%) were Adenocarcinoma & its variants. Out of 47 (73.4%) tumors of Large intestine 5 (10.6%) were Adenomas & 42 (89.3%) were Adenocarcinoma & its variants. In Anal canal (4.6%) there were 2 Squamous cell carcinomas & 1 malignant melanoma reported. In the Appendix (3.1%) there were single cases each of adenocarcinoma & Mucocele were noted (table-1 & 2).

Table-1: Site wise distribution of lower GI neoplasms.

S.no	Site	No of specimens	Benign tumours	Malignant tumors	Total no. of tumors
1	Jejunum	32	...	1	1 (1.5%)
2	Ileum	162	3	8	11 (17.1%)
3	Appendix	1181	1	1	2 (3.1%)
4	Cecum	31	...	6	6 (9.3%)
5	Colon	41	...	15	15 (23.4%)
6	Rectum	38	5	21	26 (40.6%)
7	Anal canal	190	...	3	3 (4.6%)
	Total	1675	9	55	64

Table-2: Spectrum of neoplasms in different parts of lower GI tract

S.no	Diagnosis	Small intestine		Large intestine			Anus	Appendix	Total
	Benign	jejunum	Ileum	Cecum	Colon	Rectum			
1	Adenoma		3			5			8
2	Mucocele						1		1
	Malignant								
3	WDAC	1	2	1	4	5		1	14
4	MDAC		1	1	5	6			13
5	PDAC		1	2		2			5
6	MAC			2	5	4			11
7	SRAC					1			1
8	TAC				1	3			4
9	ML		3						3
10	GIST		1						1
11	WDSCC						2		2
12	MM						1		1
	Total	1	11	6	15	26	3	2	64

WDAC = Well differentiated adenocarcinoma; MDAC = moderately differentiated adenocarcinoma; PDAC = poorly differentiated adenocarcinoma; MAC = Mucinous adenocarcinoma; SRAC = Signet ring cell adenocarcinoma; TAC = Tubular adenocarcinoma; ML = Malignant lymphoma; GIST = Gastrointestinal stromal tumor; WDSCC = Well differentiated squamous cell carcinoma; MM = Malignant melanoma

Table-3: Age wise incidence of small intestinal neoplasms.

S.no	Age	Adenoma	AC	GIST	ML	Total
1	0-10	1				1 (8.3%)
2	11-20	2				2 (16.7%)
3	21-30	...	...	...	...	...
4	31-40				1	1 (8.3%)
5	41-50		3			3 (25%)
6	51-60			1	1	2 (16.7%)
7	>60		2		1	3 (25%)

Out of 12 small intestine neoplasms (Jejunum - 1 & Ileum - 11), all the 3 Adenomas occurred in below 20 years of age & 5 out of 8 malignancies occurred after 50 years of age (table-3). Among the 12 small intestine neoplasms (Jejunum - 1 & Ileum - 11), 2 out of 3 Adenomas occurred in Female patients & 6 out of 9 malignancies occurred in Male patients (table-4).

Table-4: Sex wise incidence of small intestinal neoplasms.

S.no	Sex	Adenoma	AC	GIST	ML	TOTAL
1	Male	1	4		2	7
2	Female	2	1	1	1	5

Out of 47 neoplasms of Large intestine (Cecum - 6, Colon - 15, Rectum - 26), out of 5 Adenomas 3 cases occurred in below 10 years of age group & 25 out of 42 Adenocarcinomas occurred after 50 years of age group (table-5).

Table-5: Age wise incidence of large intestinal neoplasms.

S.no	Age	Adenoma	AC	Total
1	0-10	3		3 (6.3%)
2	11-20		1	1 (2.1%)
3	21-30		5	5 (10.6%)
4	31-40		6	6 (12.8%)
5	41-50	1	5	6 (12.8%)
6	51-60		13	13 (27.7%)
7	>60	1	12	13 (27.7%)

Among 47 neoplasms of Large intestine (Cecum - 6, Colon - 15, Rectum - 26), 3 out of 5 Adenomas & 22 out of 42 Adenocarcinomas occurred in Female patients (table-6).

Table-6: Sex wise incidence of large intestinal neoplasms.

s.no	Sex	Adenoma	AC	TOTAL
1	Male	2	20	22 (46.8%)
2	Female	3	22	25 (53.1%)

Out of 3 Malignancies of Anal canal, 1 case of Malignant melanoma occurred between 31 to 40 years of age & both the Squamous cell carcinomas occurred after 50 years of age group. Both the tumors of Appendix (Mucocele & Adenocarcinoma) occurred in 41 to 50 years of age group.

Out of 3 Malignancies of Anal canal, malignant melanoma occurred in Female patient & both the Squamous cell carcinomas occurred in Male patients. Both the tumors of Appendix (Mucocele & Adenocarcinoma) occurred in Male patient

Table-7: Depth of invasion in surgically resected specimens of lower GI malignancies.

s.no	Site	Submucosa	Muscularis	Serosa	Total
1	Small intestine	....	6 (66.7%)	3 (33.3%)	9
2	Large intestine	....	7 (25.9%)	20 (74.1%)	27
3	Appendix	....	1	....	1
	Total		14 (37.8%)	23 (62.1%)	37

Out of 9 malignancies of Small intestine 6 (66.7%) cases showed invasion up to Muscularis & 3 (33.3%) cases up to Serosa. Out of 27 malignancies of Large intestine 20 (74%) cases showed invasion up to Serosa & 7 (25.9%) cases up to Muscularis (table-7).

Table-8: Lymph nodal status in surgically resected specimens of lower GI tract malignancies

S.no	Site	No of specimens with lymphnodes	Positive	Negative
1	Small intestine	4	3 (75%)	1 (25%)
2	Large intestine	10	7 (70%)	3 (30%)
	Total	14	10	

3 (75%) out of 4 malignancies of Small intestine with lymph nodes were positive for secondary tumor cell deposits. Out of 10 malignancies of Large intestine with lymph nodes 7 (70%) cases presented with secondary tumor cell deposits (table-8).

Table-9: Omentum status in surgically resected specimens of lower GI tract malignancies

S.no	Site	No of specimens with omentum	Positive	Negative
1	Small intestine	4	2 (50%)	2 (50%)
2	Large intestine	14	4 (28.6%)	10 (71.4%)
	Total	18	6 (33.3%)	12 (66.6%)

2 (50%) out of 4 malignancies of Small intestine with Omentum were positive for secondary tumor cell deposits (fig-1). Out of 14 malignancies of Large intestine with Omentum, 4 (28.6%) cases presented with secondary tumor cell deposits (table-9).

Table-10: Association of smoking with malignancies

s.no	Site	Male		Female		Total
		Yes	No	Yes	No	
1	Small intestine	2 (50%)	2		1	5
2	Large intestine	4(66.6%)	2		10	16
	Total	6	4		11	21

2 (50%) out of 4 male patients with Small Intestine and 4 (66.6%) out of 6 male patients with Large Intestine malignancies were smokers (table-10).

Table-11: Association of alcoholism with malignancies

s.no	Site	Male		Female		Total
		Yes	No	Yes	No	
1	Small intestine	2 (50%)	2		1	5
2	Large intestine	4(66.6%)	2	1(10%)	9	16
	Total	6	4	1	10	21

2 (50%) out of 4 male patients with Small Intestine malignancies were alcoholics. 4 (66.6%) out of 6 male patients, 1(10%) out of 10 female patients with Large Intestine malignancies were Alcoholics (table-11).

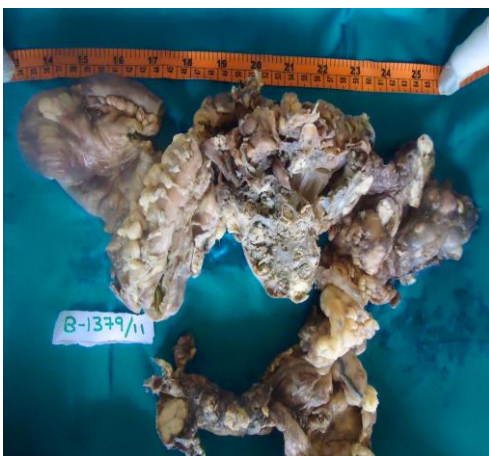


Fig.1: Adenocarcinoma of Ileum presenting with multiple Lymph nodes &Omental deposits-gross specimen.



Fig.2: Adenocarcinoma of Cecum presenting as Cauliflower like polypoidal growth-gross specimen.



Fig.3: Adenocarcinoma of Colon with dilated Cecum-gross specimen.



Fig.4: Mucinous Adenocarcinoma of Colon with secondary deposits in both Ovaries- gross specimen. (Krukenburg Tumor).

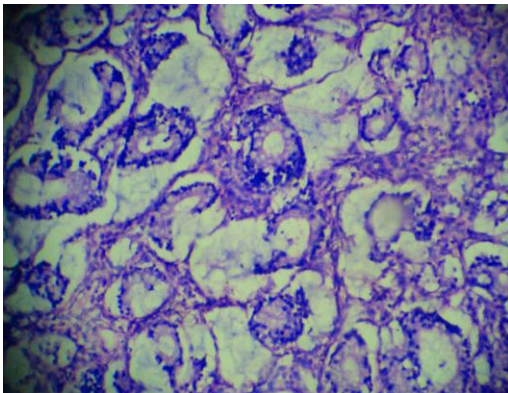


Fig.5: Mucinous Adenocarcinoma of Colon H & E - 10X.

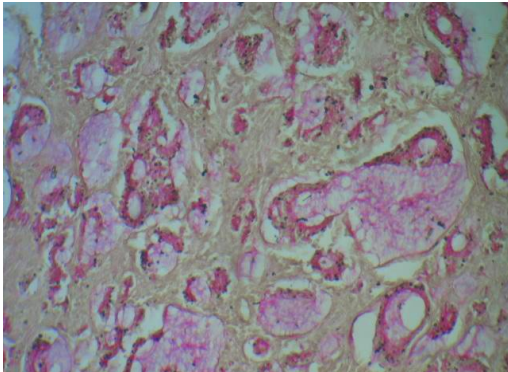


Fig.6: Mucinous Adenocarcinoma of Colon showing Mucicarmine positivity - 10X.

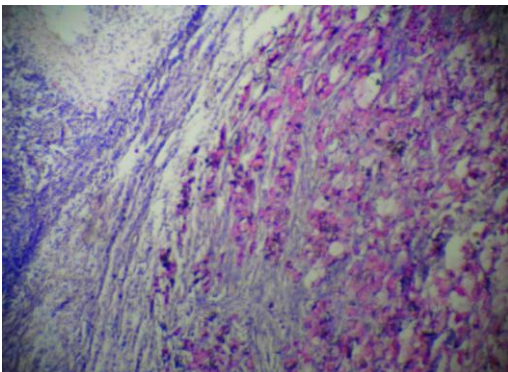


Fig.7: Ovary showing secondary Tumor Cell deposits of Mucinous Adenocarcinoma of Colon-H & E-10X. (Krukenburg Tumor)

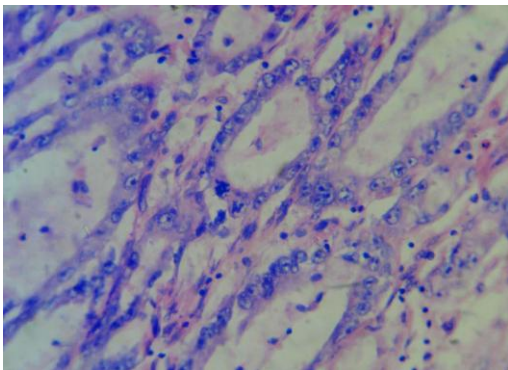


Fig.8: Tubular Adenocarcinoma H & E - 10X.

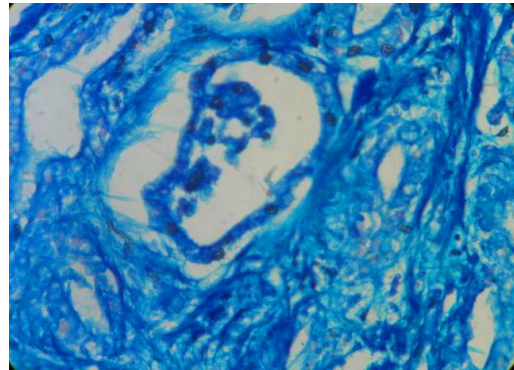


Fig.9: Tubular Adenocarcinoma showing Alcian Blue positivity- 40X.

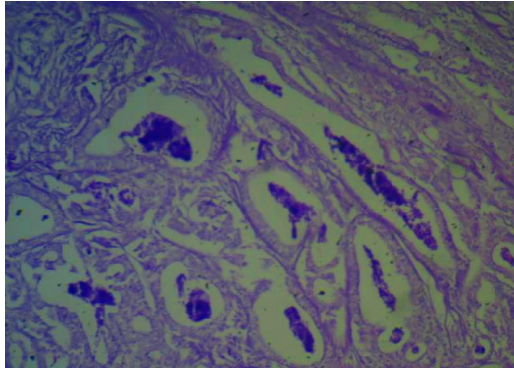


Fig.10: Tubular Adenocarcinoma showing PAS positivity -10X.

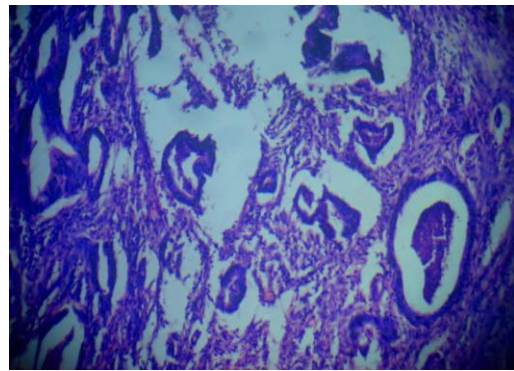


Fig.11: Well differentiated Adenocarcinoma of Appendix H&E - 10X.

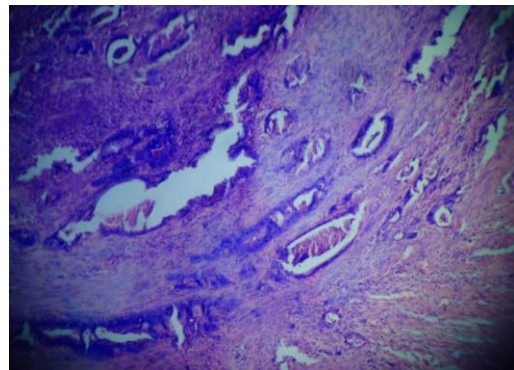


Fig.12: Adenocarcinoma of Appendix invading Muscularisexterna and sub serosa H&E - 4X.

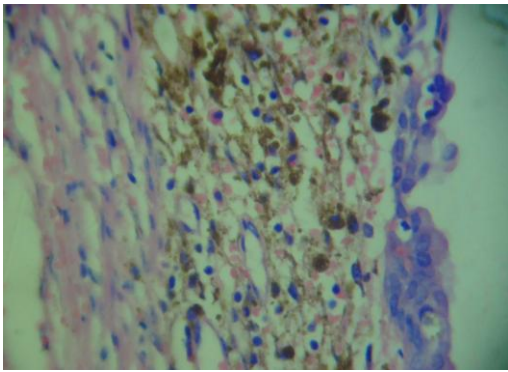


Fig.13: Malignant Melanoma of Anal Canal H&E - 40X.

DISCUSSION

Present study is a both prospective & retrospective study for a period of 5 years on different neoplasms in lower Gastrointestinal tract, their benign &

malignant nature, Site wise distribution, Age & Sex wise incidence, Depth of invasion, Lymph nodal & Omental spread of these neoplasms and correlation with certain personal habits like Smoking & Alcoholism where ever feasible. Special stains like PAS (fig-10), Mucicarmine (fig-6), Alcian blue (fig-9) & Reticulin were applied where ever possible. IHC was done for gastrointestinal stromal tumor & Malignant Lymphoma. The specimens included all the surgically resected specimens regarding lower GI Tract. Out of all specimens 70% (1181 of 1675) of specimens were from appendix.

Table-12: Comparison of site wise proportions of malignancies

S.no	Site	% of malignancies		
		Present study (n=51)	Basnet et al ^[20] (n=168)	R.Kalyani et al ^[21] (n=568)
1	Small intestine	9 (17.6%)	5.3%	2.5%
2	Large intestine	42 (82.3%)	45.5%	12.8%

In the present study most of the malignancies occurred in large intestine (82.3%) followed by small intestine (17.6%). These findings were in concordance with the study of Basnet et al^[20] & R Kalyani et al^[21] (table-12).

Table-13: Comparison of type of malignancy

S.no	Type of malignancy	Present study (n= 51)	Basnet et al ^[20] (n=168).
1	Adenocarcinoma	94.1%	80.3%
2	SCC	3.9%	4.8%
3	ML	5.8%	5.4%
4	GIST	1.9%	8.3%
5	Carcinoid	...	1.2%

In the present study Adenocarcinoma & its variants were the most common malignancies among Small & Large Intestines accounting for 94.1%, followed by Malignant Lymphoma (5.8%) & the rest includes Squamous cell carcinomas & Gastrointestinal stromal tumors. No Carcinoids were encountered in this study.

In comparison with Basnet et al^[20] study, in his study too the most common malignancy was Adenocarcinoma (80.3%) but was followed by Gastrointestinal stromal tumors (8.3%). There were Carcinoid tumors in his study sample. The variations may be due to differences in duration, period & place of study (table-13).

Table-14: Comparison of age wise proportions of lower GI tract malignancies

S.no.	Age group and M:F ratio	Present Study (n=55)	R Kalyani et al ^[21] (n=568)
1	<50 years	40%	25.8%
2	>50 years	62%	74.2%
3	Small intestine	1:0.5	1:1
4	Large intestine	1:1.1	1:0.8
5	Anal canal	1:0.5	0:1

In comparison with R Kalyani et al [21] study, most of the malignancies of the lower GI tract occurred after 50 years of age group in both the studies. There was an overall male preponderance in malignancies. In present study except in large intestine, there was a male predominance lower GI tract malignancy. In R Kalyani et al [21] study there was male predominance in Large intestine malignancies & equal proportion in Small intestine malignancies (table-14).

In the present study all the neoplasms of **Small intestine** were from Ileum except a single malignancy from Jejunum. The benign neoplasms accounted for 25% & all were Adenomas. The mean, median & mode of ages of incidence of all Adenomas of Small intestine were 9, 11 & 9 years respectively. All the Adenomas occurred only in the Pediatric age group. The male: female ratio among Small intestinal Adenomas was 1:2. 55.6% of

malignancies of Small intestine were Adenocarcinomas (fig-1), 33.3% were Malignant Lymphomas & 11.1% were gastrointestinal stromal tumors (table-15). The mean, median & mode of ages of incidence of all malignancies of Small intestine were 53.8, 52 & 45 years respectively. The male: female ratio among Small intestinal malignancies was 2:1. All the malignancies of Small intestine were showed invasion up to Muscularis & Serosa (table-7). 75% of these Small intestinal malignancies presented with secondary tumor deposits in lymph nodes (table-8) & 50% had secondary omental tumor deposits (table-9). Large tumor size, advanced histological grade, and transmural invasion are associated with decreased survival. [22] 50% of male patients were smokers and Alcoholics & none of the female patients were either smokers or Alcoholics (table-10 & 11).

Table-15: Comparison of Small intestinal malignancies

S.no		Present study	Tadashi Terada [23]	Mirna H. Farhat et al [24]	Lee WJ et al [25]
1	Sample size	9	41	33	101
2	Adenocarcinoma	55.6%	53.7%	33.3%	29.7%
3	Malignant lymphoma	33.3%	14.6%	36.4%	41.6%
4	Stromal tumors	11.1%	2.4%	27.3%	25.7%
5	Others (SCC, Secondaries, Carcinoid)	...	29.3%	3%	3%
6	Mean age years	53.8%	62	56	47.5%
	M:F	2:1	1.75:1	3.1:1	1.8:1

In comparison with Tadashi Terada, [23] Mirna H. Farhat et al, [24] Lee WJ et al [25] studies, in both Tadashi Terada [23] & present study the most common malignancy was Adenocarcinoma (fig-1) followed by Malignant lymphoma, whereas in Mirna H. Farhat et al [24] & Lee WJ et al [25] studies the most common malignancy was Malignant lymphoma followed by

Adenocarcinoma. The variation in the incidence of most common malignancy was due to variation in sample sizes & environmental conditions. In all the above studies Adenocarcinomas & Malignant lymphomas were followed by Stromal tumors. All the Small intestinal malignancies showed Male predominance & the mean age was around 50 years (table-15)

Table-16: Comparison of Small intestinal malignancies

S.no		Present study (n=9)	Lee WJ et al [25] (n=101)
1	% of Small intestinal Malignancies	7.8	1.2
2	Mean age (years) of		
	Adenocarcinoma	53.4	60.4
	Malignant lymphoma	52.3	35.1
	Stromal tumors	60	51.2

In Lee WJ et al [25] & present study the proportion of small intestinal tumors among all GI tract malignancies was low & in both the studies the mean age of incidence for Malignant lymphoma was lower than other malignancies (table-16).

In the present study in **Large intestine**, 89.4% tumors were malignant all of which were Adenocarcinomas (fig-2 & 3) & their variants & the rest i.e., 10.6% were benign neoplasms & all of them were Adenomas. The mean, median & mode of ages of incidence of all large intestinal Carcinomas were 51.9, 55 & 55 years respectively within the age range of 20 to 80 years. The Male: Female ratio of all Adenocarcinomas of Large Intestine was 1: 0.9 (table-17). Among Large intestine 50% malignancies occurred in Rectum, 35.8% in Colon & rest i.e., 14.2% in Cecum. All the malignancies of Large intestine showed invasion up to Muscularis & Serosa (table-7). 70% of these large intestinal malignancies presented with secondary tumor deposits in

lymph nodes (table-8) & 28.6% had secondary omental tumor deposits (table-9). One case of Mucinous Adenocarcinoma of Colon showing secondary Tumor Cell deposits in ovary (Krukenburg Tumor) (fig-4 & 7) reported. 66.7% of the male patients were smokers & Alcoholics, none of the female patients were smokers & 10% of female patients were alcoholics (table-10 & 11). The variants of Adenocarcinomas encountered in present study were Signet ring cell adenocarcinoma, Mucinous adenocarcinoma (fig-5) & tubular adenocarcinoma (fig-8). 40.5% of Adenocarcinomas were well differentiated & remaining 59.5% were moderate to poorly differentiated. All the Adenomas occurred in Rectum. The mean, median & mode of ages of incidence of all large intestinal Adenomas were 26.6, 6 & 6 years respectively within the age range of 5 to 66 years. 60% of Adenomas occurred in below 10 years of age. The Male: Female ratio of all Adenomas of Large Intestine was 1: 1.5.

Table-17: Comparison of Large intestinal malignancies

S.no		Present study (n=42)	Rajesh Singh Laishram et al [26] (n=54)
1	M:F	1:0.9	1.16:1
2	Proportion of rectal malignancies	50%	53.71%

In comparison with Rajesh Singh Laishram et al [26] study, in present study there was slight female preponderance whereas in his study there was slight male preponderance. In both the studies maximum proportion of large intestinal malignancies occurred in Rectum (table-17).

Table-18: Comparison of Large intestinal malignancies

S.no		Present study (n=42)	Howard T. Karsner [27] (n=104)
1	Most common age group affected	>50 years	>50 years
2	Most common part affected	Rectum	Rectum

In present study & Howard T. Karsner [27] study, the most common age group affected in large intestinal malignancies was more than 50 years & in both the studies major incidence of large intestinal malignancies was in Rectum (table-18).

Only 2 neoplasms occurred in **Appendix** in present study out of which 50% were benign i.e, Mucocele & 50% were

malignant i.e., Adenocarcinoma (fig-11). Both the neoplasms Occurred in 41 to 50 years of age group & both these tumors occurred in male patients only.

In comparison to McCusker ME et al [28] studies, in both the studies there was Male preponderance among Adenocarcinomas of Appendix.

In the present study only malignant tumors, no benign tumors occurred in **Anal**

canal. 66.7% of Anal canal malignancies were Squamous cell carcinomas & the rest were Malignant melanoma. Both the Squamous cell carcinomas occurred in above 50 years of age & single malignant

melanoma occurred in 31 to 40 years of age group (fig-13). Both the Squamous cell carcinomas occurred in Male patients & single malignant melanoma in female patients (table-19).

Table-19: Comparison of Anal canal malignancies

S.no		Present study (n=3)	Margaret M. Madeleine et al ^[29] (n=6411)	James V. Klas, M.D et al ^[30] (n=192)
1	SCC	66.7%	60.4%	74%
2	MM	33.3%	1.7%	4%
3	Others	...	31.9%	22%
4	20-50 years	33.3%	24%	...
5	>50 years	66.7%	76%	...
6	Mean age in years	55	...	58
7	M:F	2:1	1:1.4%	1:1.6%

In comparison with Margaret M. Madeleine et al ^[29] & James V. Klas, M.D et al ^[30] studies, in all the studies Squamous cell carcinoma was the most common malignancy of anal canal. In all the studies mentioned above, most of the malignancies occurred after 50 years of age & the mean age was also above 50 years. In present study there was male predominance but in both the comparative studies there was female predominance & the variation was due to small sample size of present study (table-19).

In present study three cases of Malignant lymphoma located in Ileum. All these occurred after 40 years of age group with mean age being 52.5 years & showed a Male, Female ratio of 1:1. One case of Malignant Lymphoma was diagnosed as Non Hodgkin Lymphoma of B - Cell type with IHC study.

There was one case of Malignant Gastrointestinal stromal tumors in present study, occurred in Ileum after 50 years of age group with mean age of 57.5 years & seen in female patient. The case was diagnosed as gastrointestinal autonomic nervous tumor with routine Hematoxylin& Eosin study.

In the present study there were eight cases of Adenoma, Out of which 37.5% occurred in Ileum & rest i.e., 62.5% occurred in Rectum. 75% of these Adenomas occurred below 14 years of age

& showed Male & Female ratio of 1:1.7. 25% of Small intestinal tumors & 10.6% of large intestinal tumors were Adenomas.

SUMMARY & CONCLUSIONS

Total 64 neoplasms of lower GI tract were studied both prospectively & retrospectively for a period of five years. Most of the neoplasms of lower GI tract were malignant.

The most common malignancy was Adenocarcinoma, common benign neoplasm was Adenoma.

Most of the neoplasms were from large intestine followed by small Intestine.

Maximum number of neoplasms occurred in the age group of more than fifty years.

Most of the malignancies were more common in male patients, presented late in the course of their disease.

At the time of presentation most of the Adenocarcinomas were moderate to poorly differentiated.

Different variants of adenocarcinomas encountered in present study were Mucinous adenocarcinoma, Tubular adenocarcinoma & Signet ring cell adenocarcinoma.

By the time of presentation most of the malignancies showed invasion up to muscularis externa & serosa.

Most of the malignancies showed secondary tumor deposits in the lymph nodes & omentum.

History of smoking & alcoholism was seen in most of the male patients of large Intestine.

Proportion & incidence of malignant lymphomas were maximum in small intestines.

All the adenomas presented in small & large intestines, the proportion was highest in small intestines. Seen in pediatric age group, they were more common in female patients.

Declarations

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