Section: Pathology

Original Research Article

SPECTRUM OF NEOPLASTIC COLORECTAL LESIONS- A THREE YEAR STUDY

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Abstract

Background: Colorectal diseases are frequently encountered in clinical practice. They range from minor problems causing minimal discomfort to potentially serious diseases causing much morbidity and mortality. Clinically most of these disorders present with non-specific symptoms like altered bowel habits, diarrhea, bleeding per rectum either melaena or fresh hemorrhage; thus causing much delay in drawing attention. Early detection and proper management are essential to reduce the morbidity and mortality. Various diagnostic tools are developed in the recent past, improving the detection and assessment of these lesions. The objectives are to study the spectrum of various neoplastic colorectal lesions and to know the relative frequency of various diseases, and to know the age, sex incidence and site of occurrence of the neoplastic colorectal lesions. **Materials and Methods:** This study was carried out in the tertiary care centre. The present study consisted of 187 cases of neoplastic colorectal lesions over a study period of 3 years. **Result:** The present study comprised a total of 187 cases of neoplastic colorectal lesions over a study period of 3 years. Out of 187 cases of neoplastic lesions, 127 cases (67.91%) were seen in males and 60 cases (32.09%) were seen in females. Of the 187 cases of neoplastic lesions, 17(9.09%) cases were benign and 170(90.91%) cases were malignant. Out of 187 neoplastic lesions, 85 (45.45%) cases were seen in the rectum which were mostly seen during 50 to 70 years of age, 51 (27.27%) cases in the right colon which were also mostly seen between 50 to 70 years of age and 51 (27.27%) cases were seen in the left colon mostly during 30 to 50 years of age. The present study showed the age of presentation in left colon is a decade earlier than those of lesions involved in the right colon and rectum. **Conclusion:** Colorectal lesions are one of the common causes of morbidity. In routine clinical practice, histology is often considered as the gold standard when compared with other tests. Biopsy provides an excellent opportunity for the clinician and histopathologist to correlate, colonoscopic findings and pathological features.

INTRODUCTION

Colorectal diseases are frequently encountered in clinical practice. They range from minor problems causing minimal discomfort to potentially serious diseases causing much morbidity and mortality. Clinically most of these disorders present with non-specific symptoms like altered bowel habits, diarrhea, bleeding per rectum either melaena or fresh hemorrhage; thus causing much delay in drawing attention. Early detection and proper management are essential to reduce the morbidity and mortality. Various diagnostic tools are developed in the recent past, improving the detection and assessment of these lesions. Radiographic evaluation with contrast study is useful for anatomical localization of the diseases. Visualization of the colo-rectal area is of utmost importance in the diagnosis of these diseases. Colonoscopy is playing a major role in the early detection of lesions. Rectal biopsy has always been a highly cost-effective and minimally invasive investigation for local lesions. Colorectal biopsies contribute a significant proportion of the work of most departments of diagnostic histopathology. With the introduction of flexible fibre-optic colonoscopes, sigmoidoscopes & subsequently developed digital and other technologies, the scope of biopsy diagnosis of large bowel diseases which are hitherto not approachable are now made accessible for non invasive study. In the past few decades, great

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advances have been made in the understanding the etiopathogenesis of many of the important diseases. The diseases that involve colo-rectal area are of diverse nature. The colorectum is a host to many primary neoplasms. The benign adenomatous polyps occurring in the colon and rectum are the seat for dysplasia and are pre-malignant. Colorectal carcinomas are one of the leading causes of death in western countries accounting for 15% and 12% of cancer deaths in males and females respectively.

In India, the trend is of significant increase in the incidence with urbanization, adoption of western life style and food habits. Significant advances have been made in the study of colorectal cancer in the past few years with thorough understanding of molecular basis of the disease and adenoma-carcinoma sequence, but pathologic assessment of colorectal carcinoma is of critical importance, for early detection to know the type and extent of tumor, grade and stage, and important prognostic factors, which are of crucial value in patient's treatment and predicting the prognosis. This study was undertaken to assess the type, incidence, age and sex prevalence of various diseases of colorectum in addition to the study of their gross and microscopic features.

Aim of the Study

1. To study the profile of various neoplastic colorectal lesions and to know the relative frequency of various diseases included in it.
2. To know the age, sex incidence and site of occurrence of the neoplastic colorectal lesions.

MATERIALS AND METHODS

The present study was carried out in the tertiary care centre. The study consisted of colonoscopic and resected bowel specimens of colorectal lesions relating to a period of three years. The study included patients who presented with the symptoms like bleeding per rectum, diarrhoea, altered bowel habits and unexplained anaemia. They are screened and posted for colonoscopy. The present study comprised a total of 507 cases of colorectal lesions over a period of 3 years; which included 405 (79.88%) cases of colonoscopic biopsies and 102 (20.12%) cases of resected bowel specimens. Out of 507 :320(63.1%) cases are non-neoplastic lesions and 187(36.9%) cases are neoplastic lesions. The colonoscopic biopsies were taken by the gastroenterologist. The biopsies were gently teased from the endoscopy forceps into a bottle containing 10% formalin to allow rapid fixation. After fixation the biopsy specimen was wrapped in a piece of filter paper and processed in a perforated capsule. When the biopsy specimens are very tiny, they were impregnated with eosin for identification during embedding. In case of resected specimens, there were examined noting the location, size, type and extension of the growth. Cut margins were examined for tumor extension. Lymph nodes if any, were dissected and examined. Bits were taken from the growth, cut margins and the lymph nodes for histopathological examination.

After processing, the bits from both colonoscopic biopsies and larger specimens were unwrapped and embedded in paraffin. 4 to 5 microns thick sections were cut and stained with Hematoxylin and Eosin. Special stains and IHC were used wherever necessary. The sections were mounted with DPX. After assessing the adequacy of biopsy material, microscopic study of the sections was done. The tumors were categorized as per WHO classification of Gastrointestinal tract.

RESULTS

The present study comprised a total of 187 cases of neoplastic colorectal lesions over a study period of 3 years. Out of the 187 cases of neoplastic lesions, 17 cases (9.09%) were benign and 170 cases (90.91%) were malignant. Out of 187 cases of neoplastic lesions, 127 cases (67.91%) were seen in males and 60 cases (32.09%) were seen in females which are most commonly seen between 40 to 60 years of age.

Table 1: Distribution of Neoplastic lesions (187 cases)

Neoplastic Lesions	Number of Cases	Percentage (%)
Benign	17	9.09
Malignant	170	90.91
Total	187	100

Table 2: Age and Sex incidence of Neoplastic lesions (187 cases)

Age (Years)	Males		Females		Total
	Number of Cases	%	Number of Cases	%	
0-10	0	0	0	0.00	0
11-20	2	1.57	0	0.00	2
21-30	11	8.66	4	6.67	15
31-40	15	11.81	3	5.00	18
41-50	29	22.83	16	26.67	45
51-60	29	22.83	19	31.67	48
61-70	28	22.05	12	20.00	40
>70	13	10.24	6	10.00	19
Total	127	100	60	100.00	187

Table 3: Age wise and Site wise distribution of neoplastic lesions (187 cases)

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Age in Years	Right colon		Left colon		Rectum	
	Number of cases	%	Number of cases	%	Number of cases	%
0-10	0	0.00	0	0.00	0	0.00
11-20	2	3.92	1	1.96	3	3.53
21-30	8	15.69	7	13.73	14	16.47
31-40	4	7.84	10	19.61	14	16.47
41-50	7	13.73	12	23.53	14	16.47
51-60	15	29.41	9	17.65	16	18.82
61-70	15	29.41	8	15.69	15	17.65
> 70	0	0.00	4	7.84	9	10.59
Total	51	100.00	51	100.00	85	100.00

Out of 187 neoplastic lesions, 85 (45.45%) cases were seen in the rectums which were mostly seen during 50 to 70 years of age, 51 (27.27%) cases in the right colon were mostly seen between 50 to 70 years of age and 51 (27.27%) cases were seen in the left colon, mostly during 30 to 50 years of age.
The present study showed the age of presentation in left colon is a decade earlier than those of lesions involved in the right colon and rectum.

Table 4: Sex wise and Site wise distribution of neoplastic lesions

Gender	Right colon		Left colon		Rectum	
	Number of Cases	%	Number of Cases	%	Number of Cases	%
Males	41	80.39	30	58.82	58	68.24
Females	10	19.61	21	41.18	27	31.76
Total	51	100.00	51	100.00	85	100.00

Table 5: Comparison of various neoplastic lesions

Study	Number of cases	Neoplastic lesions	
		Benign	Malignant
R.H.Teague et al,[1]	32	15(26.3%)	17(29.8%)
Sidney J. et al,[2]	82	42(19.8%)	40(18.9%)
Present study	187	17 (9.09%)	170(90.91%)

To, summarize among the various neoplastic lesions, malignant lesions were more common compared to benign lesions.

Table 6: Comparison of Age and Sex incidence in colorectal lesions

Study	Total no of cases (n=)	Mean age	Sex incidence		Sex ratio M:F
			Males	Females	
Das P et al,[6]	32	46.14 yrs	23	9	2.5:1
Saira Basher et al,[3]	1000	42.12 yrs	524	476	1.1:1
Aljebreen AM et al,[4]	113	55 yrs	65	48	1.3:1
Shen SS et al,[5]	434	52 yrs	241	193	1:2:1
Abdul Kareem FB et al,[7]	420	50.7 yrs	237	183	1.3:1
Present study	187	48.7yrs	124	63	2:1

Table 7: Comparison of site incidence with other studies

Site	Aljebreen AM et al,[4]	Shen SS et al,[5]	Das P et al,[6]	Present study
Rectum	54 (48%)	69 (16%)	14 (44%)	76 (44.70%)
Descending colon	32 (28%)	182 (42%)	6 (19%)	47 (27.65%)
Transverse colon	4 (4%)	22 (5%)	2 (6%)	-
Ascending colon	23 (20%)	161 (37%)	10 (31%)	47 (27.65%)
Total	113 (100%)	434 (100%)	32 (100%)	170 (100%)

Of the 85 cases of neoplastic lesions involving rectum, 58 (68.2%) cases were males and 27 (31.76%) cases were females. In 51 cases of right colon, 41 cases (80.39%) were males and 10 (19.61%) were females and in 51 cases involving left colon, 30 cases (58.32%) were males and 21 cases (41.18%) were females. In all the neoplastic lesions, rectum is the common site, with a male predilection in all the sites.

In the present study, of the 17 benign lesions, there were 15 cases of adenomas, of which 9 (60%) cases were tubulo-villous adenomas, which were composed of both tubular and villous structures, each contributing no more than 80% of the tumor mass, of these 6 cases were in males and 3 in females. Followed by 3 cases (20%) of Tubular adenoma, all of which presented in males; these lesions histologically have a predominant tubular configuration with back to back arrangement of the glands, stratification of the lining epithelium with hyperchromatic nuclei, mitoses and mucin depletion. Of the 3 cases (20%) of Villous adenomas, 2 cases were seen in females and 1 case was seen in a male diagnosed histologically basing on villous architecture of the mucosa, where the length of the glands exceeding twice the thickness of the normal

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colorectal mucosa. There were 2 cases of Spindle cell tumors which showed bland nuclear features, these were seen in sub-mucosa, hence diagnosed as benign spindle cell neoplasm? Gastrointestinal stromal tumor advised CD-117 to confirm the diagnosis.

The age of presentation of these 170 cases of malignant neoplasms ranged from 18 to 84 years with peak age of occurrence was between 40 to 70 years of age with 132 cases accounting to 77.65%. Out of the 170 malignant neoplasms, 18 (10.5%) cases were resected specimens. Of which, 11(61.1%) cases were in the right side of the colon and the type of the growth is mostly polypoidal. And in 7 (38.9%) cases growth was seen in the left side of the colon and the type of the growth is constrictive and diffusely infiltrative type. Extension into muscularis propria was seen in 14(77.7%) cases and serosal extension is seen in 11(61.1%) cases. Cut margins were free from tumor in all the cases. Lymph nodes showed metastasis in 9(50%) cases. Carcinoma in younger age group i.e. less than 40 years accounted for 28 cases (16.47%). The mean age of occurrence was 48.72 years. In general, all carcinomas show male preponderance comprising 114 cases (67.05%) followed by females comprising 56 cases (32.95%).

HISTOLOGICAL SUBTYPES OF CARCINOMAS:

Adenocarcinoma:

This was the most common histological type seen in the present study with 157 cases (92.35%). The age range of these was 18 to 84 years with a peak age incidence between 40 to 70 years. There was male preponderance with 105 cases comprising to 66.88%, whereas females comprised 52 cases accounting to 33.12%. Most of the adenocarcinomas were well differentiated(Fig.3) accounting for 111 cases (65.30 %), 26 cases (15.30%) were moderately differentiated, followed by 20 cases (11.76%) were poorly differentiated(Fig.4) tumors. Regarding to the site of the tumor the most common site involved is rectum followed by right and left colon.

Mucinous carcinoma:

There were 3 cases of mucinous carcinoma (Fig.5) in the present study occuring in the age range between 42 to 70 years with 2 cases occurring in males and 1 case presenting in a female. There was equal distribution of mucinous carcinomas in respect to the site, Out of 3 cases, 1 involved right colon, 1 involved left colon and the other one involved rectum. Microscopically, all the tumors had abundant extracellular mucin amounting to more than 50% of the tumor with neoplastic cells forming islands in pools of mucin. Two cases had signet ring cells in pools of mucin and another case showed glandular formation of cells in pools of mucin.

Signet ring cell carcinoma:

There were 3 cases of signet ring cell carcinoma (Fig.6&7) in the present study, with an age range of 26 to 46 yrs, all the 3 cases presented in males and involved rectum. On microscopy, tumor was composed of sheets of signet ring cells amounting to more than 50% of tumor.

Figure 1: Proliferative growth of Adenocarcinoma along with Tubulo-villous adenoma

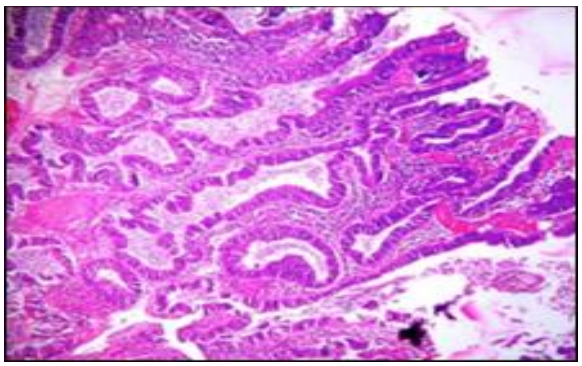

Figure 2: Tubulo-villous adenoma (H&Ex100) – Tubular & villous glands.

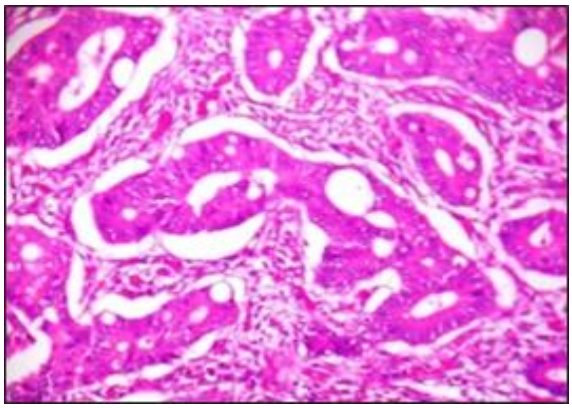

Figure 3: Well differentiated adenocarcinoma (H&Ex400)

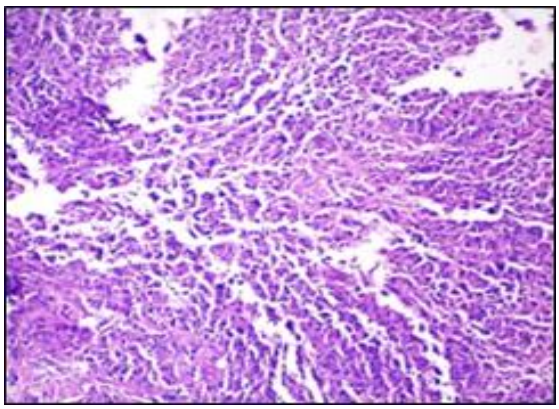

Figure 4: Poorly differentiated adenocarcinoma (H&Ex100)

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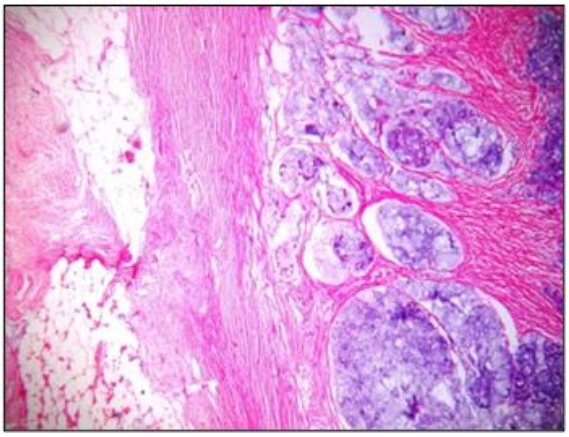

Figure 5: Mucinous carcinoma (H&Ex100)- Extracellular pools of mucin

Figure 6: Diffuse infiltrative growth of Signet ring carcinoma involving rectosigmoid

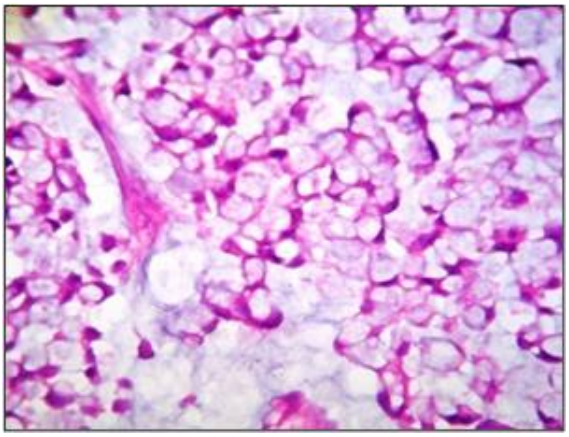

Figure 7: Signet ring cell carcinoma (H&Ex400)

DISCUSSION

This study was undertaken to know the age groups, sex distribution and frequency of benign and malignant neoplasms with various histological types and to assess the utility of colonoscopic biopsies in detection of early lesions. In the present study, neoplastic lesions account for 187 cases (36.88%), of which benign lesions were 17 (9.09%) and malignant lesions were 170 (90.91%). This correlated with study done by R.H.Teague et al,[1] in which benign lesions accounted for 26.3% and malignant lesions were 29.8% and in the study by Sidney et al,[2] benign lesions accounted for 19.8% and malignant lesions were 18.9% of cases.

Age and Sex Incidence

Patients in the present study belonged to all the age groups, the youngest being a five days old neonate and the oldest being the 87 year old male. This observation is indicative of the fact that colonoscopic biopsy is a safe routine procedure in all age groups. This was in accordance with the studies made by Saira Bashir et al,[3] where the age groups ranged from 18 months to 80 years.

Neoplastic lesions of colorectum were more common in between 30 to 60 years of age. The neoplastic lesions were more common during 40 to 60 years of age. This was in accordance with studies made by Aljebreen AM et al,[4] Shen SS et al,[5] Das P et al,[6] and Abdul Kareem FB et al,[7] were the neoplastic lesions are commonly seen in 40 to 60 years of age, but the mean age of presentation varies.

Malignant tumors of lower gastrointestinal tract have a long natural history and present at a later age in a fairly advanced stage. In the present study, males were affected more than females and male: female ratios were 1.9: 1 in non-neoplastic lesions and 2.1: 1 in neoplastic lesions. This is in accordance with the studies done by Saira Bashir et al3 which showed M:F ratio of 1.1:1 in non neoplastic lesions. The sex incidence of neoplastic lesions was in accordance with Das P et al,[6] Aljebreen AM et al,[4] Shen SS et al,[5] and Abdul Kareem FB et al,[7] which showed 2.5:1, 1.3 :1, 1.2:1, and 1.3:1 respectively. Various studies on colorectal lesions claimed that most cases are attributed to westernized diet, tobacco and alcohol consumption. Since, these habits are more common in males. Recently, there is change in the distribution pattern in some countries which indicate that the carcinoma has increased steadily in low-risk population also, particularly among females possibly due to changing life style habits. This leads to the near equal incidence of colorectal cancers in males and females.

In the present study, the most common site of malignancy was rectum with 76 (44.7%) of cases followed by descending colon and ascending colon each contributing to 47 (27.65%) of cases, which was in accordance with the studies done by Aljebreen AM et al,[4] and Das P et al,[6] with 48% and 44 % respectively.

In Shen SS et al,[5] study descending and sigmoid colon was the common site with 42% cases followed by ascending colon with 37%, and a low incidence of 16% in rectum. This study shows a trend towards increase in ascending colon carcinomas.

CONCLUSION

Colorectal lesions are one of the common causes of morbidity. In routine clinical practice, histology is often considered as the gold standard when compared

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with other tests. Biopsy provides an excellent opportunity for the clinician and histopathologist to correlate, colonoscopic findings and pathological features. Colonoscopic biopsies are a challenge to the pathologist, who requires sufficient expertise in evaluating the tissues.

Of the 187 (36.88%) cases of neoplastic lesions, malignant lesions were predominant constituting to 90.9% of cases and benign lesions to 9.09% with Male: Female ratio 2.1:1. The rectum is the common site for neoplastic lesions comprising 44.70% of total neoplastic lesions.In the present study, benign lesions constitute 17 cases, of which neoplastic polyps constitute 15 cases, of which 9 (60%) were tubulovillous adenomas followed by 3(20%) of tubular adenomas and 3(20%) of villous adenomas.Of the 187 neoplastic lesions, malignant lesions constituted 170 (90.09%) of cases, and are more common in the rectum with 76 (44.7%) of cases, followed by left colon and right colon each constituting 47 (27.6%) of cases.The age of presentation of the malignant neoplasms ranged from 18 to 84 years with mean age of occurrence 48.72 years and peak age of occurrence was seen between 40 to 70 years of age with 132 (77.6%) of cases.Adenocarcinoma was the most common histological type seen in the present study with 92.3% of cases. There was male preponderance with 66.8%, whereas females comprised 33.12% with Male: Female ratio 2:1. Most of the adenocarcinomas were well differentiated accounting for 70.7%, 16.5% were moderately differentiated followed by 12.7% of poorly differentiated carcinomas.There were 13 cases of other histological types of carcinomas which included 3 cases of Mucinous carcinoma, 3 cases of Signet ring carcinoma, 2 cases of Adenocarcinoma with neuroendocrine differentiation, 2 cases of Squamous cell carcinoma, 1 case of Adenosquamous carcinoma, 1 case of Hodgkin's disease and 1 case of Malignant melanoma.

Colorectal cancer is a common and lethal disease. The adenoma - carcinoma sequence offers a window of opportunity in which the precursor lesion or early carcinoma can be removed endoscopically to prevent systemic disease. The result of a careful and systematic examination of surgical specimens plays an important role in patient care and the assessment of prognosis.The pathology report should include information about the site or sites of tumor, size, configuration and circumference of the bowel wall involved, distance of resected margin from the tumor, depth of infiltration, tumor grade, local inflammatory reaction, perineural invasion, lymphatic emboli and lymph node involvement.Despite promising findings with molecular and immunohistochemical analysis, tumor stage is still regarded as the most important prognostic factor in colorectal cancer. The other prognostic factors include histologic grade, vascular invasion, perineural invasion and tumor border configuration. The extent of the disease forms the basis for therapeutic decisions. Follow up of the patients is suggested to know the prognosis and further evaluation.

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