International Journal of Medical and Pharmaceutical Research

Online ISSN-2958-3683 | Print ISSN-2958-3675
Frequency: Bi-Monthly
Available online on: https://ijmpr.in/

Original Article

Histopathological Spectrum of Colorectal Biopsies in Ajmer Region (Rajasthan)

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OPEN ACCESS

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Received: 20-04-2026
Accepted: 10-05-2026
Available online: 25-05-2026

ABSTRACT

Introduction: Inflammatory bowel diseases (IBD) such as Crohn's disease and ulcerative colitis (UC) necessitate accurate and precise diagnosis for effective treatment. Colonic tuberculosis (TB) can mimic CD in clinical presentation, endoscopic appearance and histological findings. Eosinophilic enteritis an uncommon idiopathic condition is marked by inflammation dominated by eosinophils with counts exceeding 50 eosinophils/HPF in the colon. Adenomatous polyps are premalignant growths with varying levels of dysplasia and can evolve into carcinomas.1Colorectal cancer (CRC) ranks as the third most prevalent cancer among men (663,000 cases, representing 10.0% of all cancers) and the second most common among women (570,000 cases, accounting for 9.4% of all cancers) globally.2

Material And Methods: It is a prospective study of 150 colorectal biopsy studied from January 2023 to December 2024 received in Pathology department of a tertiary care hospital at JLN Medical College Ajmer Rajasthan to evaluate all the colorectal biopsies reported during this period. Samples are collected from patients of all age groups. Informed consent was obtained from the participants and the study was approved by Institutional Ethical Committee.

Results: In this study, abdominal pain (74.67%) and altered bowel habits (72%) were the most common symptoms, followed by bleeding per rectum (50.67%), highlighting these as key clinical presentations. Similarly, Shrestha R et al13 and Vani B et al15 reported rectal bleeding as the predominant symptom, seen in 45.3% and 86% of cases, respectively, along with constipation and weakness. Karve S H et al16 found constipation most frequent (34.6%), followed by rectal bleeding (30.8%), with diarrhea and combined symptoms being less common. These findings collectively emphasize that rectal bleeding and bowel habit changes are consistent indicators across studies.

Conclusion: This study concludes that various types of Non-neoplastic, Benign, Malignant lesions occur in large intestine and anal canal affecting the individuals from early childhood to late adulthood. Most of these lesions present vaguely which prevent their early diagnosis and treatment leading to grave complications. In this study non-neoplastic conditions were most prevalent(80.66%) Followed by Benign condition (10.00%) and Malignant condition (9.33%). The rectum emerged as the most commonly affected site.

Keywords: *Inflammatory Bowel Disease, Crohn's Disease, Ulcerative Colitis, Colorectal Cancer, Colorectal Biopsy Histopathology.*

INTRODUCTION

The colon is the site of various distinct lesions including those that are inflammatory, idiopathic, infectious, and neoplastic. Non-specific colitis is the most frequent cause of colorectal issues.[1]

Inflammatory bowel diseases (IBD) such as Crohn's disease and ulcerative colitis (UC) necessitate accurate and precise diagnosis for effective treatment. Colonic tuberculosis (TB) can mimic CD in clinical presentation, endoscopic appearance and histological findings. Eosinophilic enteritis an uncommon idiopathic condition is marked by inflammation dominated by eosinophils with counts exceeding 50 eosinophils/HPF in the colon. Adenomatous polyps are premalignant growths with varying levels of dysplasia and can evolve into carcinomas.[1] Colorectal cancer (CRC) ranks as the third most prevalent cancer among men (663,000 cases, representing 10.0% of all cancers) and the second most common among women (570,000 cases, accounting for 9.4% of all cancers) globally.[2]

Colorectal lesions may be either benign or malignant with patients presenting a range of symptoms. These symptoms could be specific to conditions such as bleeding per rectum (PR) and abdominal pain associated with CRC or polyps, bloody diarrhoea linked to IBD and diarrhea attributable to colitis. Colonoscopy remains the standard diagnostic tool for addressing colorectal complaints, playing a key role not only in diagnosis but also in surveillance and management[3]. Colonoscopy has been a common practice since the early 1970s[4,5]. This procedure is considered safe and enables direct visualization of the mucosa of the rectum, colon, and terminal ileum. It is recognized as the gold standard for colorectal carcinoma screening and is capable of detecting advanced colonic neoplasms in asymptomatic individuals.[6] Additionally, colonoscopy coupled with colorectal biopsy remains the most critical tool in the evaluation of patients with various neoplastic and non-neoplastic lesions of the colon and rectum.[7,8] Colonoscopy biopsies are now conducted not only for disease diagnosis but also for monitoring the progression of various conditions and for early detection of complications.[9]

Aim/Objective:
To study the histopathological spectrum of lesions of colon and rectum on colonoscopic biopsies and age wise and sex wise distribution of these lesions.

MATERIAL AND METHODS:
It is a prospective study of 150 colorectal biopsy studied from January 2023 to December 2024 received in Pathology department of a tertiary care hospital at JLN Medical College Ajmer Rajasthan to evaluate all the colorectal biopsies reported during this period. Samples are collected from patients of all age groups. Informed consent was obtained from the participants and the study was approved by Institutional Ethical Committee.

Inclusion criteria:
All the colonoscopic biopsies taken from colon and rectum, received in the Department of Pathology irrespective of patient's age.

Exclusion criteria:
1. Poorly fixed/unfixed specimens.
2. Patients presenting with lesions in anal canal.
3. Inadequate biopsies in terms of no mucosal glands, only fibrocollagenous tissue, etc.
4. Intact specimen (whole colorectum) will not be included.

RESULTS AND OBSERVATIONS:

Table 1: Age wise Distribution of Patients with colorectal lesions

Age Distribution (in years)	No. of Patients	%
<1	13	8.67
1-10	23	15.33
11-20	10	6.67
21-30	7	4.67
31-40	21	14.00
41-50	21	14.00
51-60	22	14.67
61-70	23	15.33
71-80	7	4.67
>80	3	2.00
Total	150	100.00
Mean±SD	38.001±24.77	

The table no.1 represents the age distribution of the study participants. The largest group (15.33%) comprises patients aged 1-10 years and 61-70 years. Other notable groups include those aged 51-60 years (14.67%), 31-40 years (14.00%), and 41-50 years (14.00%). Smaller percentages of patients are in the age groups <1 year (8.67%), 11-20 years (6.67%), 71-80 years (4.67%), and 21-30 years (4.67%). The least represented group is those aged >80 years, with only 2.00%. The total number of patients is 150, with a mean age of 38.00 years (±24.77 years).

GRAPH NO.1
Age wise Distribution of Patients with colorectal lesions

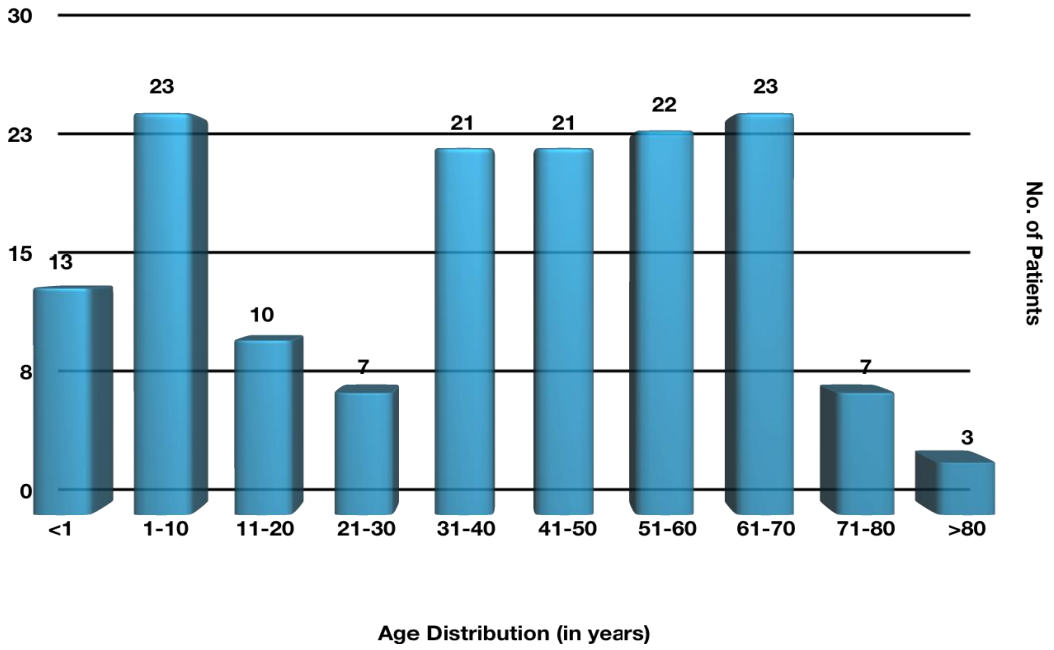


Table 2: Gender wise Distribution of Patients with colorectal lesions.

Gender	No. of Patients	%
Female	60	40.00
Male	86	57.33
Total	150	100.00

The table no.2 shows the gender wise distribution of the study participants. The majority of patients were male, accounting for 57.33%, while 40.00% were female.

GRAPH NO.2
Gender wise Distribution of Patients with colorectal lesions

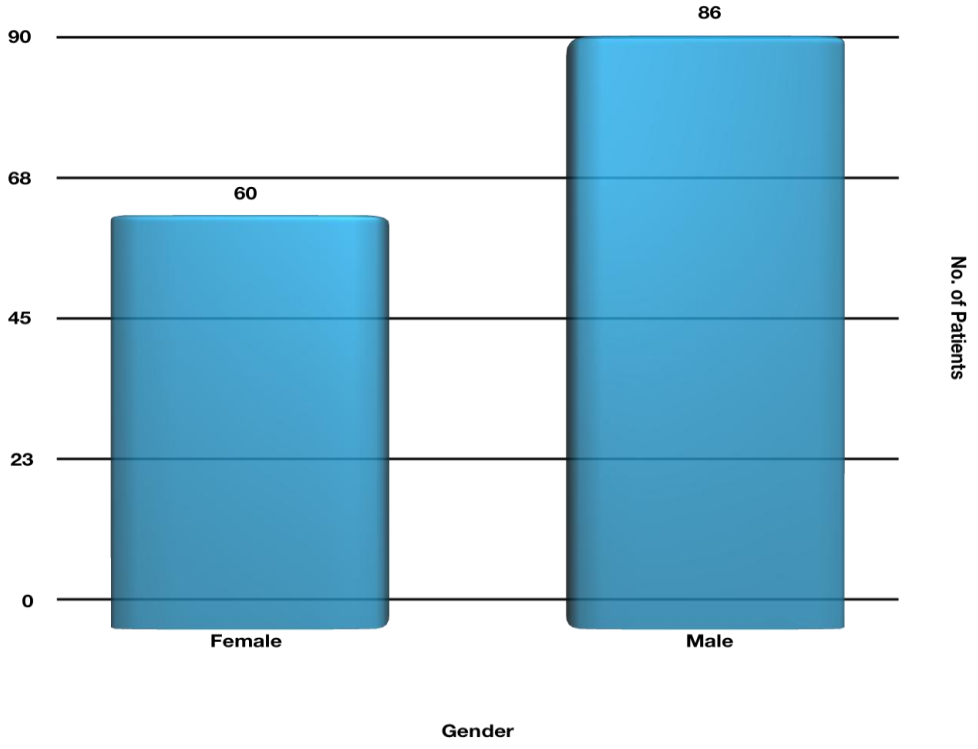


Table 3: Site wise Distribution of Patients with colorectal lesions.

Site	No. of Patients	%
Caecum	3	2
Ascending Colon	14	9.33
Transverse Colon	11	7.33
Descending Colon	13	8.66
Sigmoid colon	24	16.00
Rectosigmoid	11	7.33
Rectum	74	49.33
Total	150	100.00

The table no.3 represents the distribution of patients based on the site of colorectal lesion. The rectum was the most frequently involved site, accounting for 74 patients (49.33%), followed by the sigmoid colon with 24 patients (16.00%). The rectosigmoid region and transverse colon were affected in 11(7.33%) patients each, while the ascending colon was affected in 14 (9.33%) patients. Sites such as the descending colon were identified in 13 (8.66%). This distribution highlights the rectum as the most commonly affected site among the study population.

GRAPH NO.3
Site wise Distribution of Patients with colorectal lesions

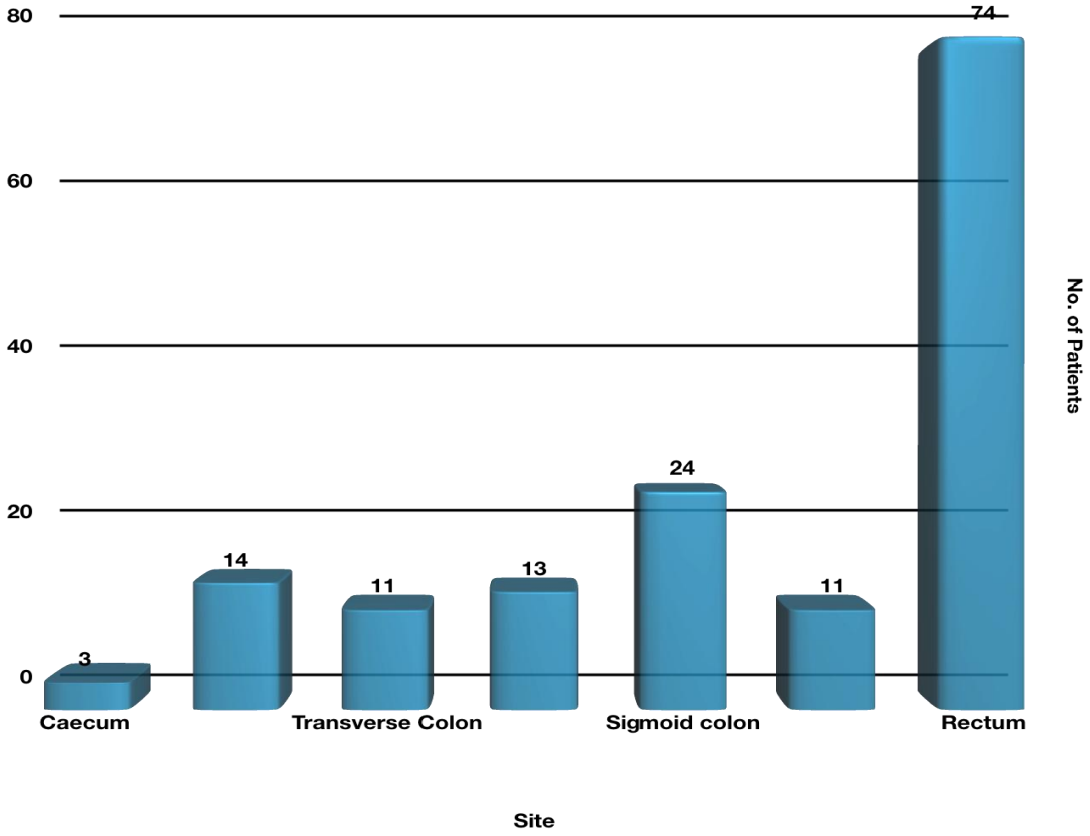


Table 4: Clinical presentation of patients with colorectal lesions.

Clinical Features		No. of Patients	%
Bleeding per rectum	Present	76	50.67
	Absent	74	49.33
Pain abdomen	Present	112	74.67
	Absent	38	25.33
Altered bowel habits	Present	108	72.00
	Absent	42	28.00

The table no.4 represents the clinical features observed in the study participants. Bleeding per rectum was present in 50.67% of patients. Abdominal pain was reported in 74.67% of patients. Altered bowel habits were present in 72.00% of patients.

GRAPH NO. 4
Clinical presentation of patients with colorectal lesions.

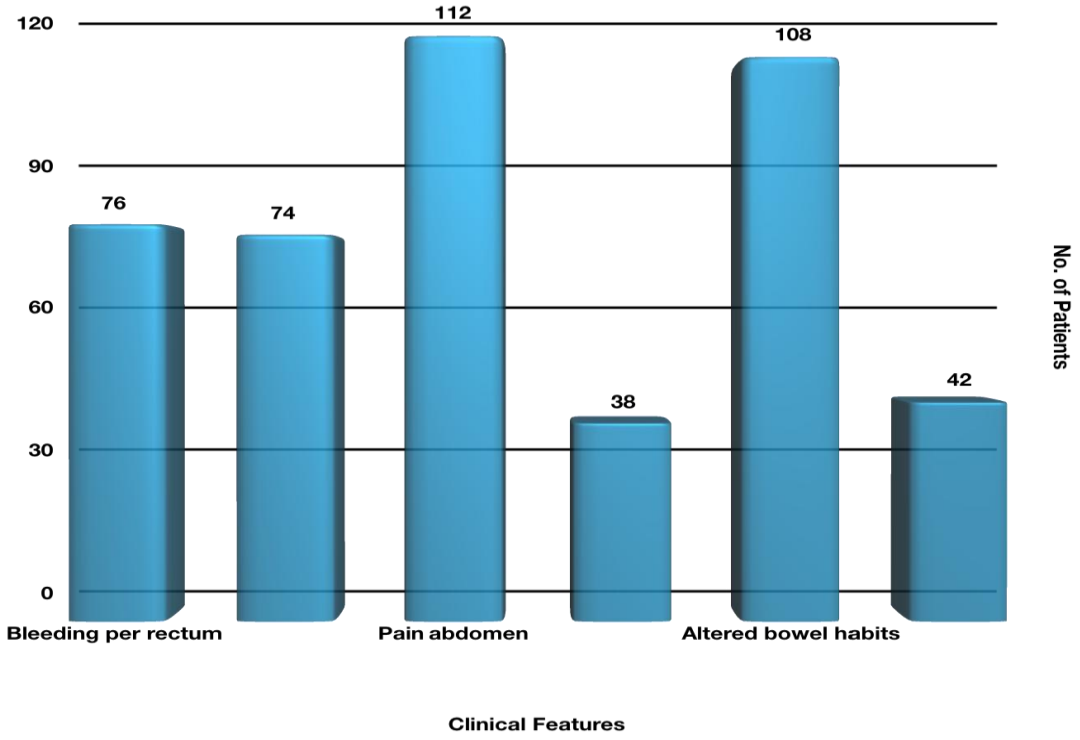


Table 5: Provisional clinical diagnosis of patients with colorectal lesions.

Provisional Clinical Diagnosis	No. of Patients	%
CA Rectum	23	15.33
IBD	22	14.66
Rectal polyp	16	10.67
Hirschsprung disease	15	10.00
Colitis	13	8.67
Proctitis	17	11.34
perforation peritonitis	8	5.33
Tuberculosis	7	4.66
SRUS	4	2.67
Rectocele	3	2.00
Celiac Disease	2	1.33
F/U/O ARM	2	1.33
Fistula	2	1.33
Haemorrhoids	2	1.33
rectal prolapse	2	1.33
rectal ulcer	3	2
CA Ascending Colon	1	0.67
CA Colon	2	1.34
CA sigmoid colon	1	0.67
colonic ulcer	1	0.67
Intestinal obstruction	2	1.34
Meckel's Diverticulum	1	0.67
Sigmoid colonic polyp	1	0.67

Table no.5 shows the distribution of patients based on provisional clinical diagnoses. The most common diagnosis was CA Rectum, identified in 23 patients (15.33%), followed by Inflammatory Bowel Disease (IBD) in 22 patients (14.66%) and Rectal Polyp in 16 patients (10.67%). Hirschsprung disease was diagnosed in 15 patients (10.00%), and Colitis was noted in 13 patients (8.67%). Other frequently encountered conditions included proctitis (17 patients, 11.34%), perforation peritonitis, and tuberculosis, each affecting 8 (5.33%) and 7 (4.66%) respectively. Various less common diagnoses such as SRUS, rectocele, celiac disease, and others were also reported, each constituting a small percentage of the total cases. This table highlights the diversity of clinical diagnosis in the study population.

GRAPH NO. 5
Provisional clinical diagnosis of patients with colorectal lesions

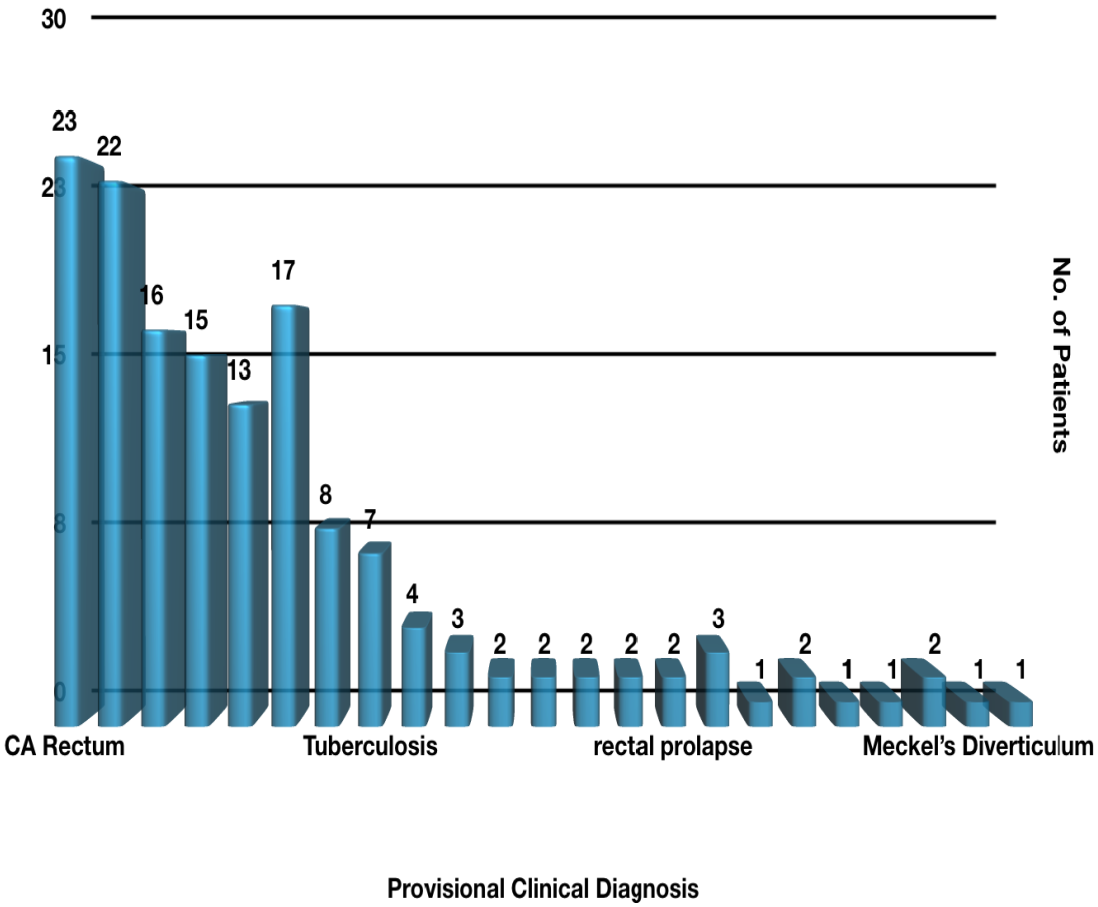


Table 6: Histopathological spectrum of colorectal lesions.

Microscopic Examination	No. of Patients	%
Nonspecific colitis	67	44.66
Ulcerative colitis	12	8.00
Crohn`s disease	1	0.66
Acute colitis	28	18.66
Granulomatous inflammation	4	2.66
Juvenile polyp	9	6.00
Hyperplastic polyp	1	0.66
Inflammatory polyp	1	0.66
SRUS	3	2.00
Lipoma	1	0.66
Adenocarcinoma	14	9.33
Normal pathology	2	1.33
Other	7	4.66

The table no.6 presents the distribution of patients based on microscopic examination findings. Non-specific colitis was the most common finding, observed in 67 patients (44.66%), followed by acute colitis in 28 patients (18.66%) and Adenocarcinoma in 14 patients (9.33%). IBD-UC and IBD-CD in 12 (8.00%) and 1 (0.66%) patient respectively. Juvenile polyp were also identified in 9(6.00%) patients. Other pathological findings included hyperplastic polyp, Hirschsprung disease, SRUS, ARM, each comprising a small proportion of the cases. Normal pathology was reported in 2 patients (1.33%). These findings highlight the most common microscopic diagnosis among the study population.

GRAPH NO. 6
Histopathological spectrum of colorectal lesions

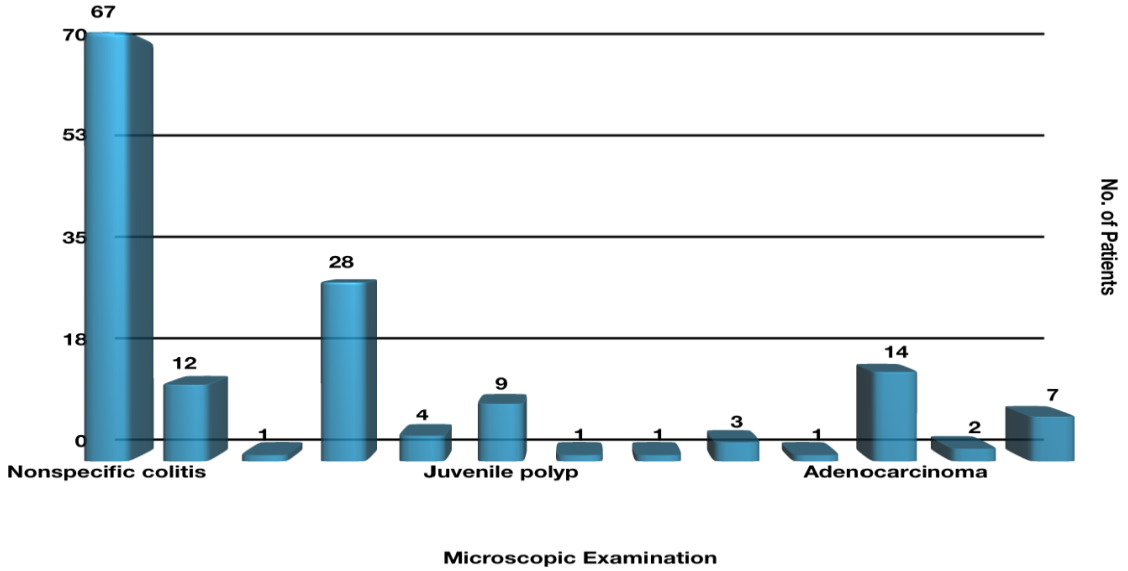
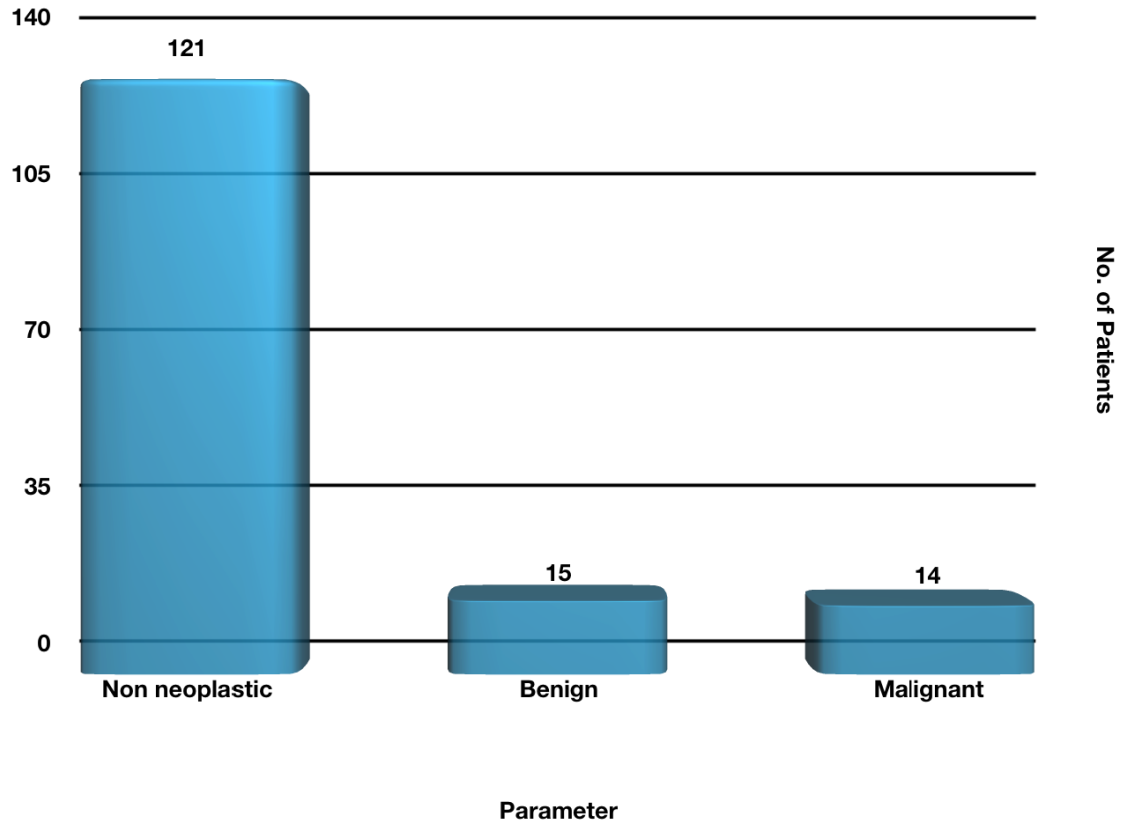


Table 7: Nature wise distribution of Colorectal lesions.

Parameter	No. of Patients	%
Non neoplastic	121	80.66
Benign	15	10.00
Malignant	14	9.33
Total	150	100

Table no.7 represents the distribution of patients based on the nature of the lesion. Out of the total patients 121(80.66) were classified as having non-neoplastic lesion, 15 (10.00%) were classified as having benign conditions, while 14 (9.33%) were found to have malignant conditions.

GRAPH NO. 7
Nature wise distribution of Colorectal lesions



MORPHOLOGY OF COLORECTAL LESIONS:

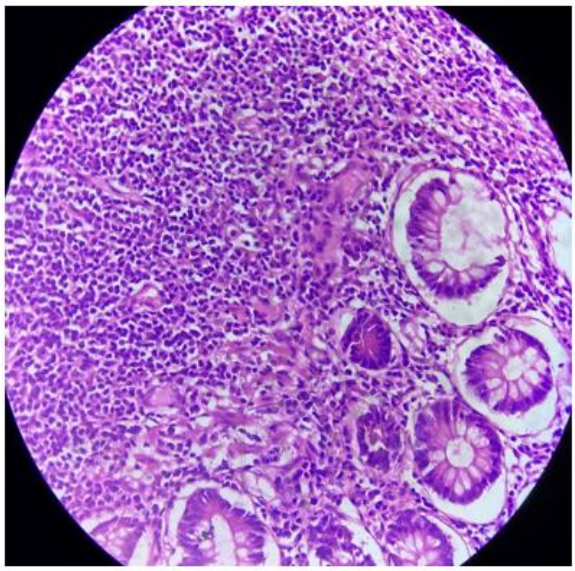


Figure 1 Microscopic pathology shows colonic glands, infiltrated with chronic inflammatory cells mainly lymphocyte and plasma cells (H&E 40X).

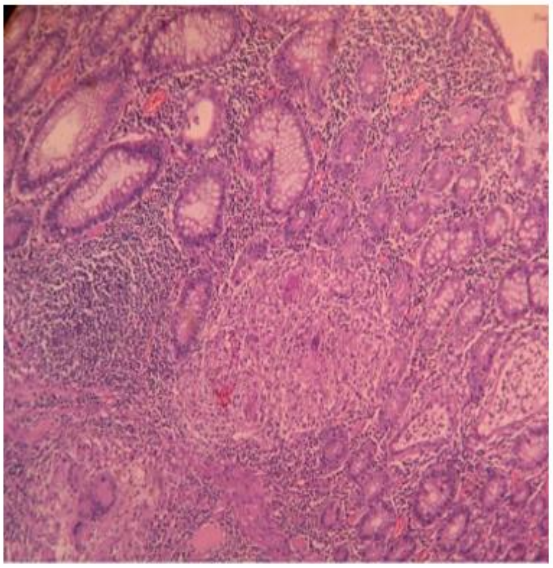


Figure 2; Colonic Tuberculosis; section shows granulomatous lesion with multinucleated giant cells, caseating necrosis and chronic inflammatory infiltration. (H&E,40X)

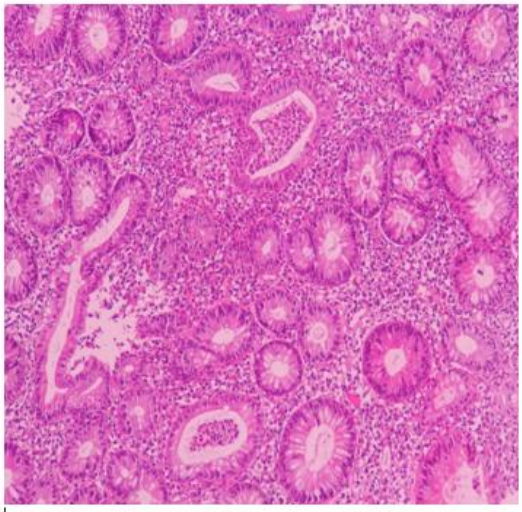


Figure 3: Ulcerative colitis; section shows crypt architecture distortion including irregular shape and size of crypts with marked inflammation. (H&E,40X)

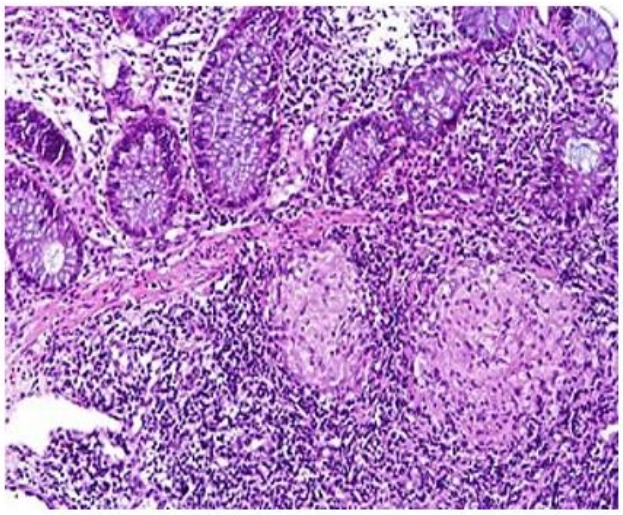


Figure 4; Crohn's disease; section shows epithelioid non necrotizing granuloma with fibrosis and neutrophilic infiltration. (H&E,40X)

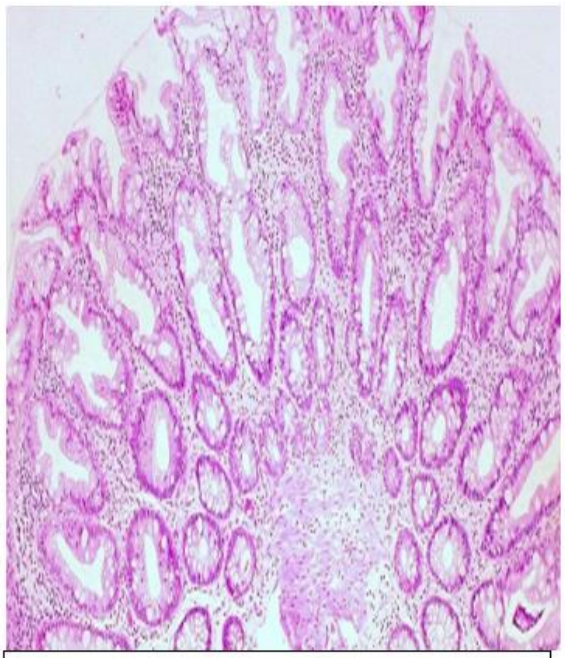


Figure 5: Hyperplastic Polyp; Showing colonic mucosa with elongated and serrated crypts with preserved crypt architecture. (H&E;10X)

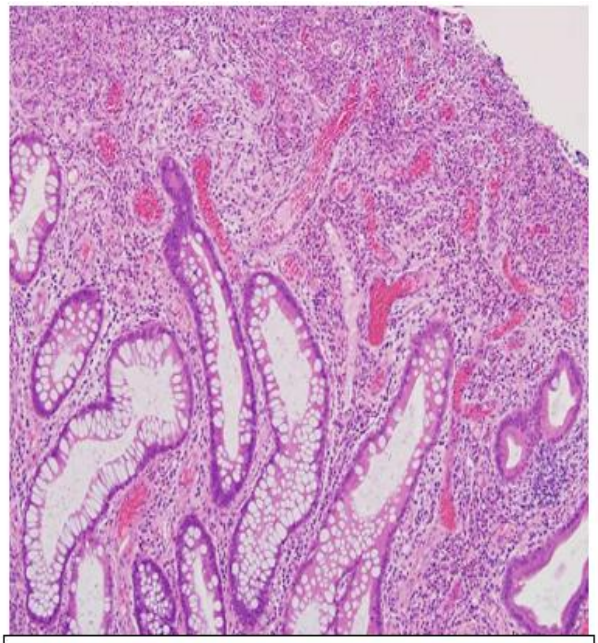


Figure 6: Juvenile Polyp; Section shows abundant inflamed stroma and frequent dilated mucin filled crypts(H&E;10X).

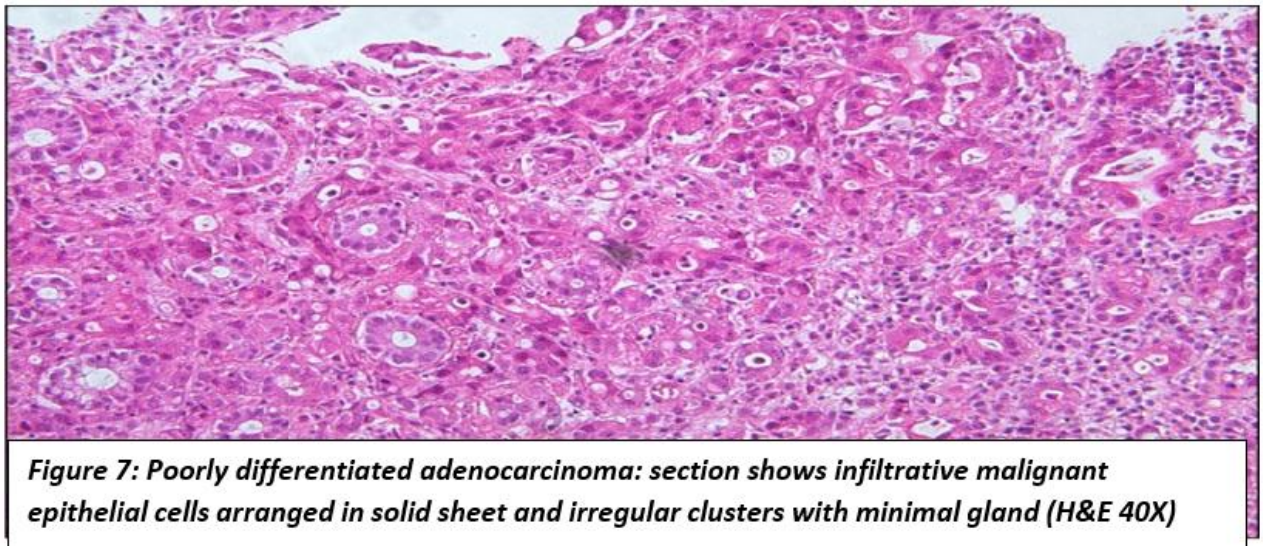


Figure 7: Poorly differentiated adenocarcinoma: section shows infiltrative malignant epithelial cells arranged in solid sheet and irregular clusters with minimal gland (H&E 40X)

DISCUSSION:

The age range in present study is 1–10 and 61–70 years as compared to age group 61–70 years in study done by Sharma P et al10 and Jamkhandi U et al11 and 31–40 age group in study done by Tahiliani H T et al12 and Shrestha R et al13. In contrast, Shah N et al14 reported a peak in the 21–30 years group, reinforcing that colorectal conditions are not confined to older populations but are increasingly affecting younger age groups.

The study presents the gender-wise distribution of study participants, revealing a male predominance, with 57.33% of patients being male and 40.00% female which is similar to the study Sharma P et al10 reported that among 89 cases of colorectal carcinoma, males accounted for a higher proportion (64%) compared to females (36%), underscoring a clear male predominance in their cohort, Similarly Tahiliani H T et al12 noted a striking male majority in their study of 150 colorectal lesion cases, with 98 male patients (65.3%) and 52 females (34.7%). Similarly, Shah N et al14 observed that among 400 patients, 256 were male (64%) and 144 female (36%), again confirming a male predominance with a ratio close to 1.78:1However, not all studies reflected this trend. Jamkhandi U et al11, for instance, reported a slight female

predominance among 44 cases, with 24 females (54.6%) and 20 males (45.4%). The resulting male-to-female ratio of 0.8:1 suggests a marginally higher prevalence in females within that particular group.

In the present study, the rectum was the most affected site (49.33%), followed by the sigmoid colon (16%), ascending colon (9.33%), descending colon (8.66%), and both the rectosigmoid region and transverse colon (7.33% each), indicating rectal predominance. Similarly, Sharma P et al10 and Jamkhandi U et al11 reported the rectum as the most frequent site, comprising 25.8% and 55.2% of cases, respectively, with the sigmoid colon as the next most common site. Tahiliani H T et al12 also found the rectum most involved (32.7%), with adenocarcinoma (NOS) being the most frequent histology. In contrast, Shah N et al14 observed the colon (32.75%) and appendix (29%) as leading sites, with rectal involvement notably lower (16.25%), suggesting some variation in anatomical distribution across studies.

In this study, abdominal pain (74.67%) and altered bowel habits (72%) were the most common symptoms, followed by bleeding per rectum (50.67%), highlighting these as key clinical presentations. Similarly, Shrestha R et al13 and Vani B et al15 reported rectal bleeding as the predominant symptom, seen in 45.3% and 86% of cases, respectively, along with constipation and weakness. Karve S H et al16 found constipation most frequent (34.6%), followed by rectal bleeding (30.8%), with diarrhea and combined symptoms being less common. These findings collectively emphasize that rectal bleeding and bowel habit changes are consistent indicators across studies.

In this study, non-specific colitis was the most common finding (44.66%), followed by acute colitis (18.66%), adenocarcinoma (9.33%), ulcerative colitis (8%), juvenile polyps (6%), and Crohn's disease (0.66%). Rare cases included hyperplastic polyps, Hirschsprung disease, SRUS, ARM, and 1.33% showed normal histology. In contrast, studies by Umana T et al17, Sheikh B et al18, and Padma S et al19 reported adenocarcinoma NOS as the most frequent lesion (30–31.4%), with ulcerative colitis and tubular adenomas appearing less commonly. Tahiliani H T et al12 noted an even higher adenocarcinoma rate (60.6%) and more ulcerative colitis (15.3%). Shrestha R et al13 reported comparable rates of adenocarcinoma (34.7%) and non-specific colitis (33.7%). Across studies, rare tumors and inflammatory conditions varied in frequency, but adenocarcinoma and colitis remained dominant.

CONCLUSION:

This study concludes that various types of Non-neoplastic, Benign, Malignant lesions occur in large intestine and anal canal affecting the individuals from early childhood to late adulthood. Most of these lesions present vaguely which prevent their early diagnosis and treatment leading to grave complications. In this study non-neoplastic conditions were most prevalent(80.66%) Followed by Benign condition (10.00%) and Malignant condition (9.33%). The rectum emerged as the most commonly affected site.

This study emphasises the need for early diagnosis of the disease through histopathology, which when correlated clinically will help the clinician to implement the appropriate treatment and improve overall survival of the patient.

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