

Original Research Article

SPECTRUM OF HISTOPATHOLOGICAL LESIONS OF COLONOSCOPIC BIOPSIES : A 2 YEAR STUDY

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ABSTRACT

Background: Colonoscopic biopsy remains a cornerstone for diagnosing colorectal diseases that range from inflammatory to neoplastic lesions. Understanding the histopathological spectrum of these lesions helps correlate clinical and endoscopic findings, guiding effective management strategies. **Objective:** To evaluate the spectrum and frequency of histopathological lesions in colonoscopic biopsies over a two-year period.

Materials and Methods: This retrospective observational study was conducted in the Department of Pathology over two years (May 2023–May 2025). A total of 42 colonoscopic biopsy specimens were analyzed. All samples were processed, stained with Hematoxylin and Eosin, and examined microscopically. Lesions were classified into non-neoplastic and neoplastic categories based on the 2019 WHO classification of digestive system tumors. Data were analyzed using SPSS version 25.0.

Results: Among 42 cases, non-neoplastic lesions constituted 74% and neoplastic lesions 26%. The most common non-neoplastic lesion was inflammatory bowel disease (38%), including ulcerative colitis (24%) and Crohn's disease (14%), followed by chronic non-specific colitis (26%). Adenocarcinoma was the predominant neoplastic lesion (21%), with moderately differentiated types being most frequent. Lesions were most commonly located in the colon (54.8%) and rectum (41.9%). A male preponderance (M:F = 2:1) was observed, and most cases occurred in patients above 50 years.

Conclusion: The study highlights that inflammatory bowel disease and adenocarcinoma are the most frequent histopathological findings in colonoscopic biopsies. Colonoscopic biopsy remains indispensable for early detection of inflammatory and malignant lesions, particularly in elderly males.

Keywords: Colonoscopy, Histopathology, Colonic lesions, Adenocarcinoma, Inflammatory bowel disease, Retrospective study.

INTRODUCTION

Colorectal diseases encompass a wide spectrum ranging from infectious and inflammatory conditions (acute/chronic colitis, inflammatory bowel disease, microscopic colitis) to premalignant adenomas and invasive carcinomas. Colonoscopy with targeted mucosal biopsy remains the gold-standard for etiologic diagnosis, therapeutic planning, and surveillance of lower gastrointestinal pathology,

especially where endoscopic appearances can be non-specific or even normal (e.g., microscopic colitis).^[1-4] Against the backdrop of rising global colorectal cancer (CRC) incidence—including early-onset disease—and a measurable burden in India, systematic audits of colonoscopic biopsy histopathology provide critical, region-specific insights for clinicians and public health programs.^[5-8] Multiple institutional series have described the histomorphological distribution on colonoscopic

biopsies, typically reporting a predominance of non-neoplastic lesions (variously 60–75%), followed by neoplastic lesions led by tubular/tubulovillous adenomas and adenocarcinoma; common non-neoplastic diagnoses include chronic non-specific colitis, IBD, infective colitis, and microscopic colitis.^[1-4,9-11] Recent Indian and international cohorts reinforce these patterns, while highlighting site distribution (rectum and left colon commonly sampled), age/sex trends, and clinico-endoscopic correlations that refine differential diagnosis and management pathways.^[1-3,9-11] Contemporary interpretation is anchored in the WHO digestive tumours classification, ensuring standardized reporting of adenomas, serrated lesions, and carcinoma subtypes.^[4,12] These data collectively justify a focused two-year evaluation of the spectrum of histopathological lesions in colonoscopic biopsies at our center to inform local diagnostic yield, case-mix, and quality metrics.

MATERIALS AND METHODS

The present study was a two-year Retrospective observational study conducted in the Department of Pathology from May 2023 to May 2025. All colonoscopic biopsy specimens received during this period were included in the analysis. A total of 42 cases were studied.

Inclusion Criteria

- Patients of all age groups and both sexes.
- Endoscopic mucosal biopsies obtained from the terminal ileum to the ano-rectal region.

Exclusion Criteria

- Upper gastrointestinal (GI) endoscopic biopsies.
- Inadequate or autolyzed biopsies unsuitable for histopathological evaluation.

Data Collection

Demographic and clinical data including age, gender, site of lesion, and colonoscopic findings were recorded for each case from the clinical requisition forms and endoscopy records.

Histopathological Examination

All biopsy specimens were fixed in 10% neutral buffered formalin, processed routinely, and embedded in paraffin wax. Serial 3–5 µm thick sections were cut and stained with Hematoxylin and Eosin (H&E) using standard protocols. Additional special stains (e.g., Ziehl–Neelsen for acid-fast bacilli, PAS for mucin, etc.) were applied wherever necessary to aid in diagnosis.

Diagnostic Evaluation

The slides were examined under light microscopy, and diagnoses were classified into non-neoplastic and neoplastic lesions based on histomorphological features following the WHO classification of digestive system tumours (2019). Correlation with clinical and colonoscopic findings was made to achieve a definitive diagnosis.

Statistical Analysis

All data were entered in Microsoft Excel and analyzed using SPSS version 25.0 (IBM Corp., Armonk, NY, USA).

- Quantitative variables (e.g., age) were expressed as mean ± standard deviation (SD).
- Qualitative variables (e.g., gender, lesion type, and site distribution) were presented as frequency and percentage.

RESULTS

Table 1: Distribution of Demographic profiles among study population

Parameters	Frequency	Percentage
Age		
11-20 Years	3	7.1
21-30 Years	10	23.8
31-40 Years	6	14.3
41-50 Years	6	14.3
>50 Years	17	40.5
Gender		
Male	28	66.7
Female	14	33.3

The present study included a total of 42 patients who underwent colonoscopic biopsy. The age of the patients ranged from 11 to more than 50 years, with a mean age of 44.6 years. The majority of cases (40.5%) were observed in individuals aged above 50 years, followed by 21–30 years (23.8%), while the least number of cases (7.1%) occurred in the 11–20 years age group. This indicates that colonic lesions

are more frequent in the elderly population, reflecting the cumulative exposure to inflammatory and neoplastic changes over time. Regarding gender distribution, males (66.7%) predominated over females (33.3%), with a male-to-female ratio of 2:1, suggesting a male preponderance for colonic pathology in the present study

Table 2: Distribution of Lesions among study population

Type of Lesion	Frequency	Percentage (%)
Non-neoplastic lesions (n=31)		
Ileum	1	3.2
Colon	17	54.8
Rectum	13	41.9
Anal Verge	0	0
Neoplastic lesions (n=11)		
Ileum	0	0
Colon	2	18.2
Rectum	7	63.6
Anal Verge	2	18.2

Table 2 shows the site-wise distribution of non-neoplastic and neoplastic lesions. Among the non-neoplastic lesions (n=31), the majority were located in the colon (54.8%), followed by the rectum (41.9%), whereas only one case (3.2%) involved the ileum. No lesions were identified at the anal verge. In contrast, among the neoplastic lesions (n=11), most

were found in the rectum (63.6%), followed by the colon (18.2%) and anal verge (18.2%). None were observed in the ileum. These findings highlight that the colon and rectum are the most frequent sites of both inflammatory and neoplastic involvement, underlining their clinical significance in endoscopic evaluation and histopathological diagnosis.

Table 3: Distribution of Type of Lesions among study population

Type of Lesion	Number of Cases	Percentage (%)
Non-neoplastic lesions (n=31)		
Inflammatory Bowel Disease (IBD)	16	38
• Ulcerative Colitis	10	24
• Crohn's Disease	6	14
Chronic Non-Specific Colitis	11	26
Tuberculous Colitis	2	5
Inflammatory Polyp	2	5
Neoplastic lesions (n=11)		
Tubular adenoma	1	2
Tubulovillous adenoma	1	2
Adenocarcinoma (WD-04/MD-02/PD-03)	9	22

The histopathological spectrum of lesions is detailed in Table 3. Out of 42 biopsies, 31 (74%) were non-neoplastic, while 11 (26%) were neoplastic. Among the non-neoplastic lesions, Inflammatory Bowel Disease (IBD) constituted the largest subgroup with 16 cases (38%), of which ulcerative colitis accounted for 10 cases (24%) and Crohn's disease for 6 cases (14%). Chronic non-specific colitis was seen in 11 cases (26%), followed by tuberculous colitis (5%) and inflammatory polyp (5%).

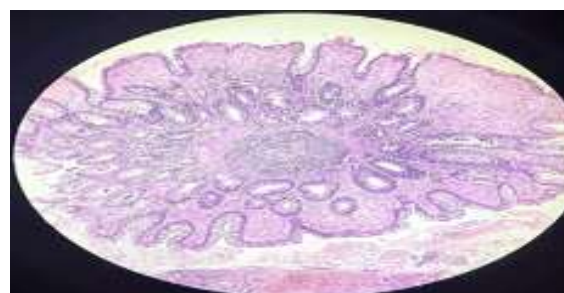
In the neoplastic category, adenocarcinoma was the most frequent lesion, comprising 9 cases (22%), with further classification into well, moderately, and poorly differentiated types. Tubular adenoma and tubulovillous adenoma were each noted in 1 case (2%). These results indicate that inflammatory bowel disease and chronic colitis dominate the non-neoplastic spectrum, whereas adenocarcinoma is the major malignant finding among neoplastic lesions.

Table 4: Distribution of Type of Lesions among study population

Type of Neoplasm	Frequency	Percentage (%)
Adenocarcinoma (Moderately Differentiated)	6	14.3
Adenocarcinoma (Poorly Differentiated)	3	7.1
Tubulovillous Adenoma	2	4.8
Total	11	26.2

As shown in Table 4, out of 11 neoplastic lesions, adenocarcinoma was the predominant histological type. Moderately differentiated adenocarcinoma accounted for 6 cases (14.3%), while poorly differentiated adenocarcinoma was found in 3 cases (7.1%). Additionally, tubulovillous adenoma was observed in 2 cases (4.8%), representing the benign neoplastic group. Overall, neoplastic lesions comprised 26.2% of all colonic biopsies examined. The predominance of adenocarcinoma, particularly in middle-aged and elderly males, reinforces the importance of colonoscopic screening and

histopathological evaluation for early detection of colorectal carcinoma.

**Figure 1: Inflammatory Polyp H & E , 40x**

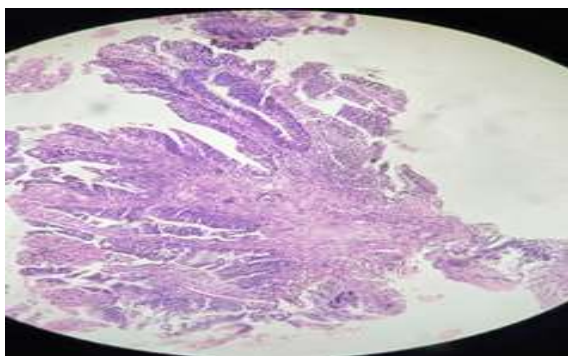


Figure 2: Tubulo-villous adenoma H & E , 40X

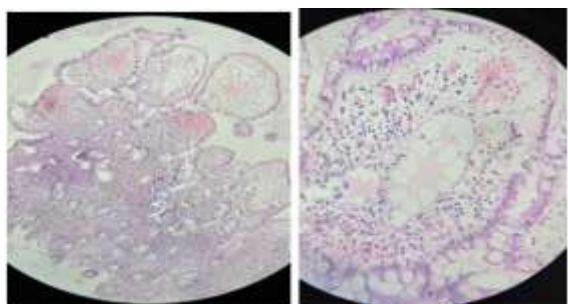


Figure 3: Crohn's disease H & E 10x and 40x

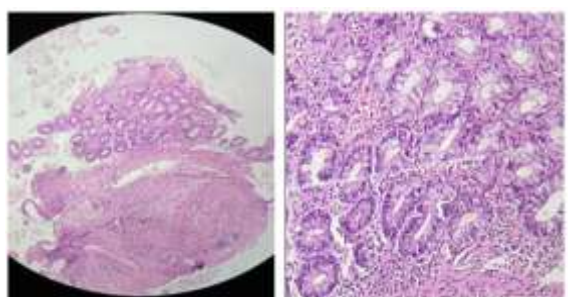


Figure 4: Ulcerative Colitis 10x and 40x

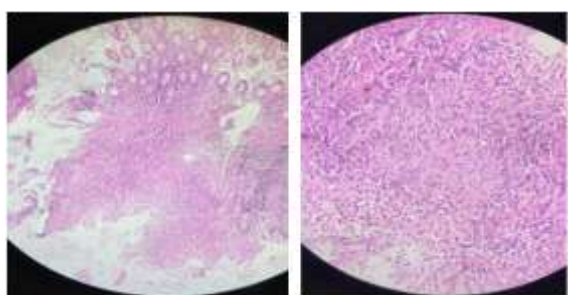


Figure 5: Tuberculosis colitis H & E 10x and 40x

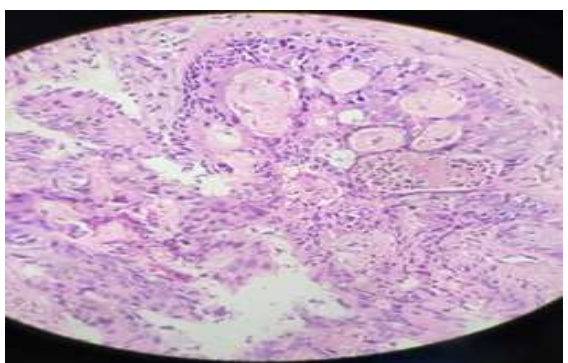


Figure 6: Moderately differentiated Adenocarcinoma H & E 40x

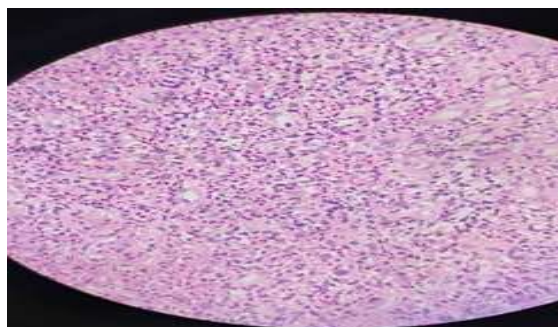


Figure 7: Poorly differentiated Adenocarcinoma H & E 40x

DISCUSSION

The present study analyzed the histopathological spectrum of colonic lesions in 42 colonoscopic biopsies over a two-year period. The findings provide insight into the relative distribution of non-neoplastic and neoplastic lesions, their demographic associations, and regional pathology trends, comparable to previous Indian and global studies.

In this study, the age of patients ranged from 11 to 75 years, with the majority (40.5%) above 50 years, suggesting that colonic lesions are more common in older age groups. This observation aligns with the findings of Geetha et al. (2018), who also reported peak incidence in the fifth and sixth decades of life in their two-year study from Andhra Pradesh (mean age 47.8 years).^[13] Similarly, Rajbhandari et al. (2019) from Nepal observed that 44% of colorectal pathologies occurred in individuals above 50 years.^[14] The male predominance (M:F = 2:1) in the present study is consistent with the reports of Abilash et al. (2017),^[15] and Kavre et al. (2017),^[16] who observed male preponderance with ratios of 1.7:1 and 1.8:1, respectively. This trend may be attributed to higher exposure of males to dietary carcinogens, smoking, and occupational stress.

The colon and rectum were the most frequent sites of biopsy, accounting for 54.8% and 41.9% of non-neoplastic lesions respectively, while neoplastic lesions predominated in the rectum (63.6%). These findings mirror those of Karve et al. (2018),^[17] who observed that the rectum and sigmoid colon were the most common biopsy sites for both inflammatory and neoplastic diseases. The predominance of rectal involvement may reflect easier accessibility for endoscopic sampling and the higher susceptibility of this region to chronic irritation and malignancy.

Non-neoplastic lesions accounted for 74% of all biopsies in this study, similar to reports by Geetha et al. (2018) (72%),^[13] and Abilash et al. (2017) (78%).^[15] Among these, Inflammatory Bowel Disease (IBD) was the most common histological diagnosis, seen in 38% of cases, with ulcerative colitis (24%) more frequent than Crohn's disease (14%). Comparable trends were reported by Abilash et al. who found 25% IBD, and Geetha et al. who observed 53% IBD among non-neoplastic lesions.^[13,15]

Chronic non-specific colitis accounted for 26% of the cases in the present study, which corresponds with the 25.5% incidence reported by Geetha et al. (2018) and 46.7% by Abilash et al. (2017).^[13,15] Tuberculous colitis constituted 5% of cases, a finding similar to the 4.6% reported by Pandey et al. (2016).^[18] The higher prevalence of infectious and inflammatory bowel diseases in developing countries like India can be attributed to poor sanitation, dietary factors, and environmental exposure.

Neoplastic lesions represented 26% of all biopsies, aligning closely with studies by Abilash et al. (2017) (21.6%) and Geetha et al. (2018) (32.6%).^[13,15] In the present study, adenocarcinoma was the most frequent malignancy (21.4%), with moderately differentiated type predominating. Similar results were reported by Rajbhandari et al. (2019) (27%) and Omar et al. (2020) (24.8%).^[14,19] The rectum was the commonest site for adenocarcinoma (63.6%), as corroborated by Karve et al. (2018) and Moore et al. (2020), who reported rectal carcinoma as the most frequent localization.^[17,20] The dominance of adenocarcinoma underscores the need for early colonoscopic surveillance, particularly in patients over 50 years presenting with rectal bleeding or altered bowel habits.

The current findings reinforce that non-neoplastic lesions—particularly inflammatory bowel disease and chronic colitis—dominate the histopathological landscape of colonoscopic biopsies in Indian settings. However, the increasing proportion of neoplastic lesions, particularly adenocarcinoma in younger individuals, indicates a transition towards Western epidemiological patterns. Similar observations were made by Omar et al. (2020) in African populations, emphasizing the influence of changing diet and lifestyle on colorectal pathology.^[19] The findings highlight the pivotal role of colonoscopic biopsy and histopathological examination in the early diagnosis and management of both inflammatory and malignant colonic conditions.

CONCLUSION

This study demonstrates that colonic lesions encompass a broad histopathological spectrum, with inflammatory bowel disease and adenocarcinoma being the most common non-neoplastic and neoplastic lesions, respectively. The predominance of lesions in the colon and rectum underscores the diagnostic significance of these regions during colonoscopic evaluation. Integration of clinical, endoscopic, and histopathological findings remains

vital for accurate diagnosis and effective patient management.

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Conflict of Interest: None

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