DOI: 10.7860/NJLM/2026/84763.2955

Original Article

Pathology Section

Histopathological Spectrum of Endoscopic Lower Gastrointestinal Tract Biopsies: A Cross-sectional Study in a Tertiary Care Hospital in Mumbai, Maharashtra, India

YOGANAND VISHWASRAO PATIL[1], MRUNAL VIJAY KESARI[2], V KALAIVANAN[3], INDRANIL BHATTACHARYA[4]

ABSTRACT

Introduction: The Lower Gastrointestinal Tract (LGIT) is susceptible to a broad spectrum of disorders, ranging from non neoplastic conditions to premalignant and malignant lesions. Endoscopic biopsy, coupled with histopathological examination, remains a cornerstone in the diagnosis and management of these conditions.

Aim: To study the histopathological spectrum of LGIT biopsies.

Materials and Methods: A cross-sectional observational study was conducted for 18 months in the Department of Pathology at Jagjivan Ram Hospital, Western Railways, Mumbai, Maharashtra, India. A total of 250 LGIT biopsies received between October 2022 and April 2024 were included in the study. Biopsies were processed and examined using standard histopathological protocols. Special stains, including Periodic Acid-Schiff (PAS), Ziehl-Neelsen Acid-Fast Bacilli (AFB), Masson's trichrome, Alcian blue, and Congo red, were performed wherever indicated. Clinical data including age, sex, presenting symptoms, and biopsy site were analysed for their association with histopathological findings. These findings included assessment of mucosal architecture, crypt distortion, lamina propria cellularity, inflammatory infiltrate patterns, ulceration, granuloma formation, dysplasia, and tumour grade. Categorical variables were expressed as numbers and percentages, while quantitative variables were expressed as mean±standard deviation or median with interquartile range. Quantitative variables were compared using Analysis of Variance (ANOVA), whereas qualitative variables were analysed using the Chi-square test or Fisher's exact test when expected cell counts were less than five. Data were entered in Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) version 25.0. A p-value <0.05 was considered statistically significant.

Results: Patients ranged in age from 1 to 86 years, with a mean age of 46.3 years. The study population showed a slight male predominance, with a male-to-female ratio of 1.17:1. The most common clinical presentations were chronic diarrhoea in 101 (40.4%) cases and bleeding per rectum in 95 (38%) cases. The colon was the most frequent biopsy site, accounting for 100 (40%) cases, followed by the rectum in 60 (24%) cases. Histopathological evaluation revealed non neoplastic lesions in 208 (83.2%) cases, with non specific inflammation being the most common finding in 128 (51.2%) cases. Premalignant lesions were identified in 19 (7.6%) cases, predominantly tubular adenomas, while malignant lesions were seen in 23 (9.2%) cases, mainly adenocarcinomas. Neoplastic lesions showed a significant association with higher age (mean age 64.7 years) and bleeding per rectum (p-value<0.0001).

Conclusion: LGIT biopsies demonstrate a wide histopathological spectrum, with non neoplastic lesions being the most common, followed by premalignant and malignant conditions. Clinical features, particularly bleeding per rectum and anaemia, showed a significant association with neoplastic lesions. Histopathological evaluation remains indispensable for accurate diagnosis, guiding therapy, and improving patient care.

Keywords: Colonoscopy, Colorectal mucosal lesions, Diagnostic yield, Inflammatory bowel pathology, Neoplastic lesions, Non neoplastic lesions

INTRODUCTION

Disorders of the Gastrointestinal Tract (GIT) are among the most commonly encountered problems in clinical practice and are associated with significant morbidity and mortality [1]. The GIT extends from the oral cavity through the oesophagus, stomach, small intestine (duodenum, jejunum, ileum), colon, and rectum. Due to its length and complexity, it is vulnerable to a wide range of conditions, including congenital anomalies, inflammatory or infectious disorders, and both benign and malignant neoplasms [2]. Early identification and appropriate management are crucial, and gastrointestinal endoscopy in combination with biopsy plays a vital role in this process [1,2]. The GIT is broadly divided into the upper GIT and the LGIT. The upper GIT extends from the oral cavity to the duodenum, while the LGIT includes the distal small intestine and large intestine, namely the colon and rectum [3]. Lesions of the LGIT significantly contribute to global morbidity and mortality [4].

Among LGIT lesions, colorectal cancer is one of the most important neoplastic conditions. It ranks as the third most common cancer worldwide, with approximately 1.93 million new cases diagnosed annually, and is the second leading cause of cancer-related deaths, accounting for nearly 0.93 million deaths each year [5]. In India, about 65,358 new CRC cases are reported annually, making it the fifth most common malignancy in the country [6]. According to the latest GLOBOCAN data, colorectal cancer accounted for 9.6% of all new cancer cases diagnosed in 2022, ranking third among newly diagnosed cancers. It was responsible for 9.3% of total cancer-related deaths, ranking second after lung cancer [7]. By 2040, the global burden of colorectal cancer is expected to increase to 3.2 million new cases and 1.6 million deaths, with the majority occurring in countries with high or very high Human Development Index (HDI) levels [8].

Other benign LGIT conditions include polyps, non specific colitis, and premalignant lesions such as dysplasia. Histopathologically, the

LGIT exhibits a wide variety of lesions, including small intestinal and ampullary carcinomas, serrated lesions of the colon, rectum, and appendix; neuroendocrine neoplasms; anal squamous dysplasia; precursor lesions; haematolymphoid and mesenchymal tumours; EBV-positive inflammatory follicular dendritic cell sarcoma of the digestive tract; and genetic tumour syndromes of the digestive system [9]. Colonoscopy is an effective diagnostic modality for evaluating the colon and rectum up to the terminal ileum. It also allows for therapeutic interventions, including biopsy from suspicious areas for detailed histopathological examination. This enables assessment of mucosal architecture, lamina propria cellularity, and inflammatory infiltrates within the epithelium [10].

The objectives of this study were to estimate the proportion of non neoplastic, premalignant, and neoplastic lesions in LGIT biopsies, and to describe the distribution of histopathological findings across different age groups, sexes, clinical presentations, and biopsy sites.

The novelty of this study lies in its evaluation of LGIT biopsies across a wide demographic spectrum, ranging from paediatric to elderly patients, in a tertiary care centre in Mumbai, Maharashtra, India. As disease patterns in India vary by region, this diverse cohort provides valuable insights into age-related and symptom-based variations in lesion distribution. This highlights the need for updated, region-specific evidence to improve early diagnosis and patient management.

MATERIALS AND METHODS

This was a cross-sectional observational study conducted in the Department of Pathology and Laboratory Medicine at Jagjivan Ram Hospital, Western Railway, Mumbai, Maharashtra, India, for 18 months from October 2022 to April 2024. Institutional Ethics Committee (IEC) approval was obtained prior to commencement of the study (IEC No. ECR/1238/EC/19/00153).

Sample size calculation: To determine the minimum number of cases required, the standard sample size calculation formula for prevalence studies was applied: $n= Z^2 \times p \times q / L^2$

Based on a study by Sharma V et al., [11], the expected prevalence was used to calculate the sample size.

Where:

Z= Standard normal deviate at 95% confidence level (1.96, approximated to 2)

p= Expected prevalence (52.5%)

q= 1 – p = 47.5%

L= Allowable absolute error, taken as 15% of the prevalence (7.8)

Substituting these values into the formula:

$n= 4 \times 52.5 \times 47.5/(7.8)^2 \approx 225$

Thus, the minimum required sample size was calculated to be 225. However, to reduce the margin of error and improve the precision of the estimates, a total of 250 LGIT biopsy reports were included in the study.

Inclusion criteria: All endoscopic biopsies from the jejunum to the anal canal (including jejunum, ileum, caecum, colon, rectum, and anal canal) received in the Department of Pathology during the study period were included in the study.

Exclusion criteria: Inadequate or poorly preserved biopsies, colorectal resection specimens and incorrectly embedded biopsies were excluded from the study.

Study Procedure

Biopsy specimens were routinely processed after fixation in 10% neutral buffered formalin and embedded in paraffin wax. Sections were cut at 4 µm thickness, cleared in xylene, hydrated and dehydrated through graded alcohols, and stained with Haematoxylin and Eosin (H&E).

Special stains including Ziehl–Neelsen (AFB), Periodic Acid–Schiff (PAS), Masson's trichrome, Alcian blue, and Congo red were applied wherever indicated.

Clinical data, including age, sex, clinical history, provisional diagnosis, and biopsy site, were obtained from the requisition forms accompanying the tissue specimens. Lesions were classified morphologically as non neoplastic, premalignant, or malignant according to the WHO Classification of Tumours of the Digestive System, 5th edition (2019) [12].

Histopathological evaluation included assessment of mucosal architecture, crypt distortion, lamina propria cellularity, inflammatory infiltrate patterns, ulceration, granuloma formation, epithelial dysplasia, and tumour grade.

Anaemia was graded as mild (10–11 g/dL), moderate (8–10 g/dL), and severe (<8 g/dL) based on the WHO criteria for anaemia severity (WHO, 2011), which are widely used in clinical and pathology-based studies [13].

STATISTICAL ANALYSIS

Categorical variables were expressed as numbers and percentages, while quantitative variables were presented as mean±standard deviation or median with 25th and 75th percentiles (interquartile range). For non normally distributed data, non-parametric tests were used. Quantitative variables were compared using ANOVA, while qualitative variables were analysed using the Chi-square test. Fisher's exact test was applied when the expected cell count was less than five. Data were entered into Microsoft Excel and analysed using the SPSS software (IBM Corp., Chicago, USA), version 25.0. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 250 endoscopic LGIT biopsies were analysed. The age of patients ranged from 1 to 86 years, with a mean age of 46.3±19.2 years. The majority of patients belonged to the 51-60-year age group, comprising 68 (27.2%) cases [Table/Fig-1].

Age (years)	n (%)
1 to 10	7 (2.80)
11 to 20	28 (11.20)
21 to 30	23 (9.20)
31 to 40	31 (12.40)
41 to 50	30 (12.00)
51 to 60	68 (27.20)
61 to 70	43 (17.20)
71 to 80	19 (7.60)
81 to 90	1 (0.40)
Mean±SD	46.3±19.2
Median (25th-75th percentile)	52.5 (32.25-60.75)
Range	1-86

[Table/Fig-1]: Age distribution.

Males constituted 135 (54%) cases, while females accounted for 115 (46%) cases, resulting in a male-to-female ratio of 1.17:1.

The most common clinical presentations were chronic diarrhoea in 101 (40.4%) cases and bleeding per rectum in 95 (38%) cases, frequently associated with anaemia [Table/Fig-2]. Anaemia was observed in 77 (30.8%) cases, with moderate anaemia being the most common severity, seen in 46 (59.74%) cases [Table/Fig-3].

The most frequent biopsy sites were the colon in 100 (40%) cases, followed by the rectum in 60 (24%) cases, and the ileum in 49 (19.6%) cases [Table/Fig-4].

Clinical history		No. of cases	Percentage
Chronic diarrhea (101 cases)	With anaemia	29	40.40%
	Without anaemia	60	
	With weight loss	12	
Bleeding per rectum (95 cases)	With anaemia	36	38%
	Without anaemia	59	
Fever ± Weight loss ± Abdominal pain ± Anaemia		35	14%
Abdominal pain (16 cases)	With anaemia	4	6.40%
	Without anaemia	12	
Chronic constipation		3	1.20%
Total		250	100%

[Table/Fig-2]: Clinical history distribution.

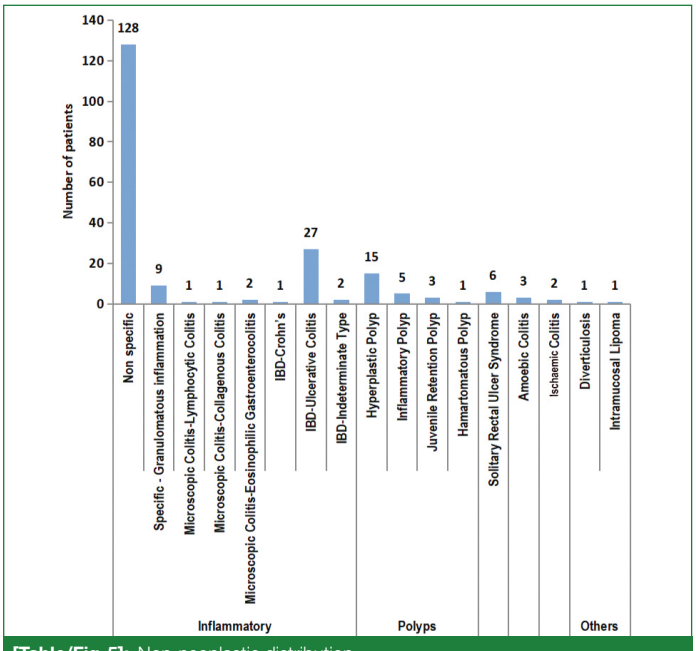
Anaemia	n (%)
Anaemic	
No	173 (69.20)
Yes	77 (30.80)
Degree of anaemia	
Mild (10-11 g/dL)	18 (23.38)
Moderate (8-10 g/dL)	46 (59.74)
Severe (<8 g/dL)	13 (16.88)

[Table/Fig-3]: Anaemia distribution.

Site of biopsy	n (%)
Caecum	23 (9.20)
Colon	100 (40.00)
Ileocecal valve	12 (4.80)
Ileum	49 (19.60)
Jejunum	6 (2.40)
Rectum	60 (24.00)
Total	250 (100.00)

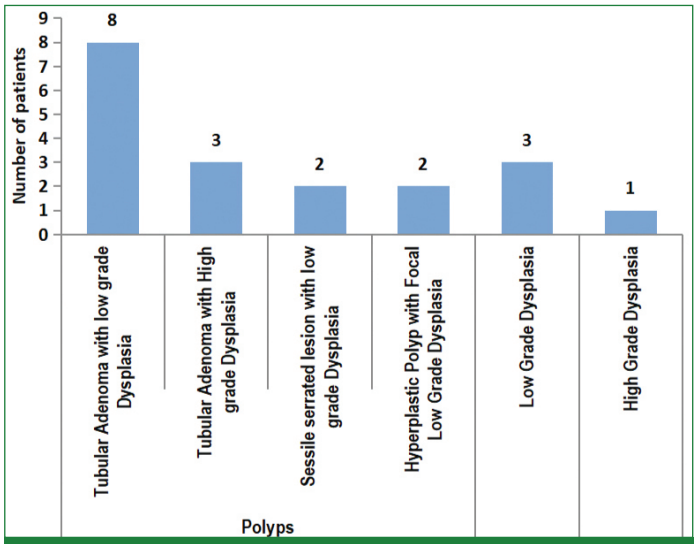
[Table/Fig-4]: Site of biopsy distribution.

Histopathological evaluation revealed a predominance of non neoplastic lesions in 208 (83.2%) cases, followed by premalignant lesions in 19 (7.6%) cases, and malignant lesions in 23 (9.2%) cases. Among non neoplastic lesions, non specific inflammation was the most common finding, observed in 128 (51.2%) cases, while ulcerative colitis was the most common specific diagnosis, seen in 27 (10.8%) cases [Table/Fig-5].



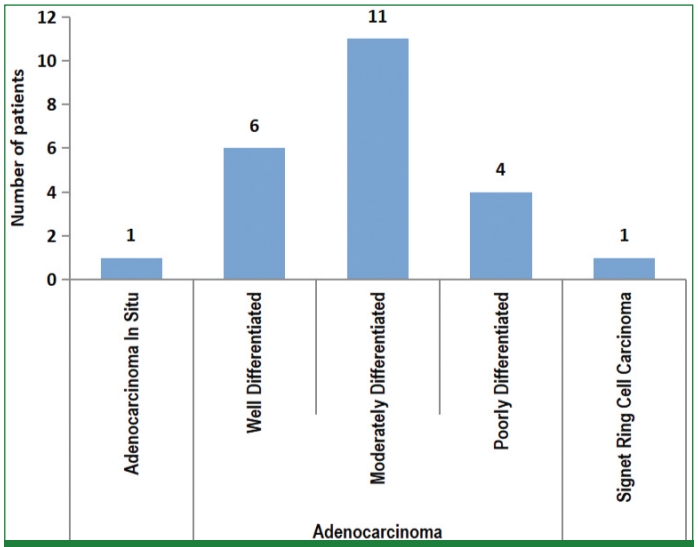
[Table/Fig-5]: Non-neoplastic distribution.

Premalignant lesions included tubular adenomas with low-grade dysplasia in 8 (3.2%) cases, high-grade dysplasia in 3 (1.2%) cases, sessile serrated lesions with dysplasia in 2 (0.8%) cases, and hyperplastic polyps with dysplasia in 2 (0.8%) cases [Table/Fig-6].



[Table/Fig-6]: Premalignant distribution.

Malignant lesions were predominantly adenocarcinomas, identified in 21 (8.4%) cases. One case each of adenocarcinoma in situ (0.4%) and signet ring cell carcinoma (0.4%) was also noted [Table/Fig-7].



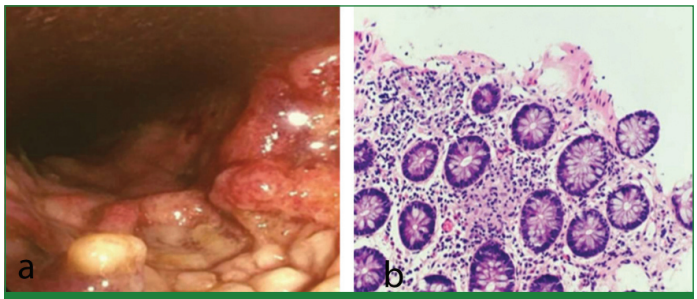
[Table/Fig-7]: Neoplastic distribution.

The mean age was significantly higher in patients with neoplastic lesions (64.7±9.05 years) compared to those with premalignant (52.05±13 years) and non neoplastic lesions (43.74±19.35 years) (p-value<0.0001). Gender distribution was comparable across all groups. Clinical features such as fever (35 [16.8%] cases), abdominal pain (49 [23.56%] cases), chronic diarrhoea (89 [42.8%] cases), and weight loss (4 [21.6%] cases) were more frequently observed in non neoplastic lesions. In contrast, bleeding per rectum was significantly more common in neoplastic lesions (17 [73.9%] cases), followed by premalignant (11 [57.9%] cases) and non neoplastic lesions (67 [32.2%] cases) (p-value<0.0001). Anaemia was most frequently observed among neoplastic cases (12 [52.2%] cases), although this association was not statistically significant (p-value=0.527) [Table/Fig-8].

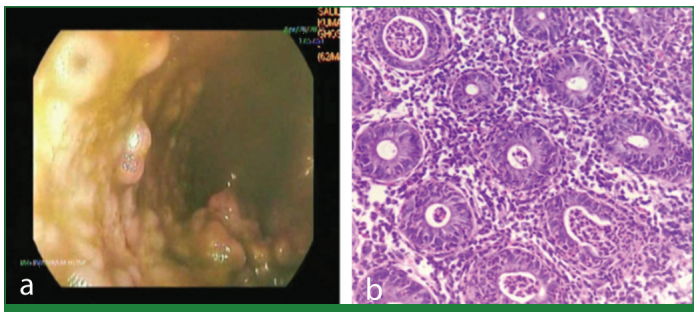
Representative endoscopic and microscopic features of Crohn's disease (cobblestoning and epithelioid cell granulomas) and ulcerative colitis (pseudopolyps with cryptitis and crypt abscesses) encountered in this study are illustrated in [Table/Fig-9,10].

Demographic and clinical characteristic	Non neoplastic (n=208)	Premalignant (n=19)	Neoplastic (n=23)	p-value
Age (years)	43.74±19.35	52.05±13	64.7±9.05	<0.0001‡
Gender				
Female	92 (44.23%)	8 (42.11%)	15 (65.22%)	0.15†
Male	116 (55.77%)	11 (57.89%)	8 (34.78%)	
Clinical symptoms				
Fever	35 (16.83%)	0	0	0.008*
Chronic diarrhoea	89 (42.79%)	6 (31.58%)	6 (26.09%)	0.216†
Bleeding per rectum	67 (32.21%)	11 (57.89%)	17 (73.91%)	<0.0001†
Abdominal pain	49 (23.56%)	2 (10.53%)	0	0.006*
Chronic constipation	3 (1.44%)	0	0	1*
Weight loss	45 (21.63%)	1 (5.26%)	1 (4.35%)	0.042*
Anaemia	85 (40.87%)	7 (36.84%)	12 (52.17%)	0.527†

[Table/Fig-8]: Comparison of demographic and clinical characteristics between non-neoplastic, premalignant and neoplastic.
*Fisher's-exact test; †Chi-square test; ‡ ANOVA

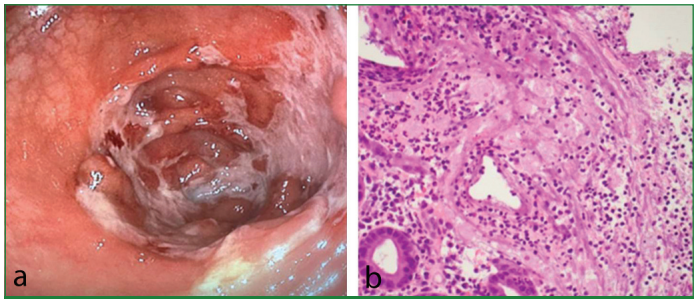


[Table/Fig-9]: Crohn's disease: a) Endoscopy showing cobblestone appearance; b) Photomicrograph showing epithelioid cell granuloma (H&E, 400x).



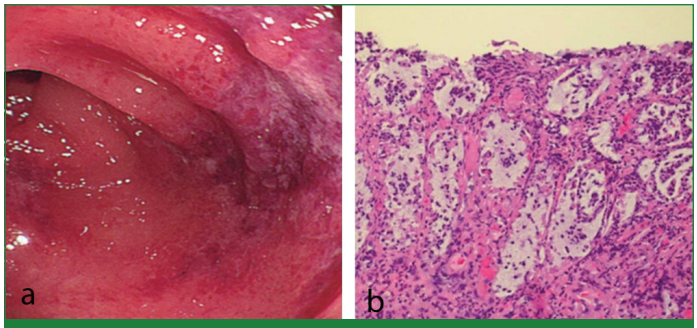
[Table/Fig-10]: Ulcerative colitis: a) Endoscopy showing multiple pseudo polyps; b) Photomicrograph showing cryptitis, crypt abscess (H&E, 400x).

Characteristic endoscopic and histopathological features of amoebic colitis, including multiple colonic ulcers with white necrotic exudates and the presence of amoebic trophozoites on microscopy, are depicted in [Table/Fig-11].



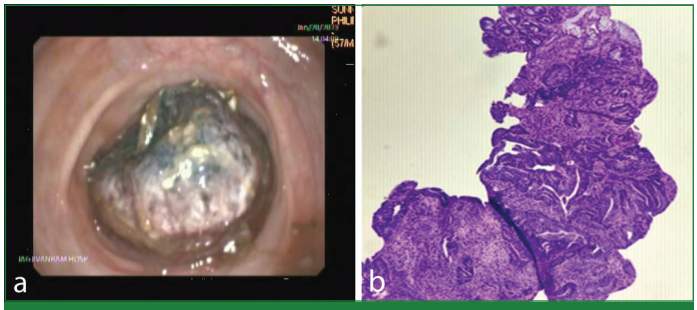
[Table/Fig-11]: Amoebic colitis: a) Endoscopy showing multiple ulcers with white exudates; b) Photomicrograph showing amoebic trophozoites (H&E, 400x).

Features of ischaemic colitis, such as colonic ulcers with surrounding erythema on endoscopy and histological findings of mucosal ulceration, crypt dropout, and active inflammation, are illustrated in [Table/Fig-12].



[Table/Fig-12]: Ischaemic colitis: a) Endoscopy showing ulcers with erythema. b) Photomicrograph showing ischaemic changes with mucosal ulceration, crypt dropout and activity (H&E, 400x)

Representative findings of adenocarcinoma, including a large ulcero-proliferative mass on endoscopy and microscopic features of moderately differentiated adenocarcinoma, are shown in [Table/Fig-13].



[Table/Fig-13]: Adenocarcinoma: a) Endoscopy showing large ulcero-proliferative mass; b) Photomicrograph showing moderately differentiated adenocarcinoma (H&E, 400x).

DISCUSSION

The present study provides a comprehensive evaluation of the histopathological spectrum of LGIT biopsies in a tertiary care setting, encompassing non neoplastic, premalignant, and neoplastic lesions across a wide age range. The findings reflect both the disease burden in the local population and their clinicopathological correlations, with important implications for early diagnosis and patient management.

Demographic profile: The mean age of patients in this study was 46.3 years, with the majority belonging to the 51-60-year age group. Notably, lesions were identified across the entire age spectrum, ranging from infancy to advanced age. This broad age distribution is noteworthy, as LGIT lesions are often perceived to predominantly affect middle-aged and elderly individuals. Detection of lesions in younger patients, including those in the paediatric age group, suggests the contribution of congenital or early-onset conditions such as Hirschsprung's disease, juvenile polyps, or inflammatory bowel disease (IBD) [11,12].

Similar mean age values have been reported in both Indian and international studies. Sharma V et al., reported a slightly younger mean age of 37.7 years, with a predominance in the third and fourth decades [11], while Devi B et al., observed a mean age of 52 years, with clustering in the fifth and sixth decades [14]. Yanik S et al., also reported comparable mean ages of approximately 52-53 years [15]. The broader age distribution observed in the present study likely reflects the inclusive nature of biopsies received at a tertiary care centre, encompassing both paediatric and adult populations.

Gender distribution in this study demonstrated a slight male predominance (54%), consistent with most Indian studies, including those by Sharma V et al., Devi B et al., [11,14], and Mishra R et al., who reported male predominance ranging from 60% to 65% [16]. In contrast, Banstola S et al., reported a female predominance in their cohort, highlighting possible regional variations in healthcare

access, referral patterns, and disease prevalence [17]. In the present study, no statistically significant gender difference was observed across non neoplastic, premalignant, and neoplastic categories. This finding is supported by Moussa FR et al., although it contrasts with the observations of Tahiliani HT et al., who reported a male predominance in both premalignant and malignant lesions [18,19].

Site-specific distribution: The colon was the most frequent biopsy site (40%), followed by the rectum and ileum. Across all sites, non specific inflammation was the most common histopathological diagnosis, particularly in the ileum and caecum. Adenocarcinomas were predominantly localised to the colon and rectum. This site-specific distribution pattern is comparable to findings reported in most Indian studies.

Histopathological spectrum: Non neoplastic lesions constituted the majority of cases (83.2%), consistent with most Indian series, which report proportions ranging from 80% to 90%. Inflammatory conditions, including non specific inflammation and ulcerative colitis, formed the most common subgroups. This predominance reflects the high burden of infectious and inflammatory gastrointestinal conditions in developing countries, influenced by dietary habits, socioeconomic factors, and hygiene-related issues. Premalignant lesions were identified in 7.6% of cases, predominantly comprising tubular adenomas and serrated lesions. Their detection underscores the critical role of endoscopic biopsy and surveillance strategies in preventing progression to colorectal carcinoma.

Malignant lesions accounted for 9.2% of biopsies, with adenocarcinoma being the predominant malignancy. The distribution based on tumour differentiation- well, moderately, and poorly differentiated- mirrored patterns reported in other studies, with moderately differentiated adenocarcinoma being the most frequent subtype. Although the proportion of neoplastic lesions in this study was lower than that reported by Ashour GA et al., (52%), it is comparable to Indian studies, which report frequencies ranging from 9% to 12% [20]. The relatively lower proportion of carcinomas in Indian studies may be attributed to differences in population demographics, referral practices, and healthcare access, as many malignant cases undergo surgical resection rather than diagnostic biopsy alone.

The predominance of non neoplastic lesions observed in the present study aligns with findings from Indian literature, whereas Western studies, such as that by Ashour GA et al., report a higher proportion of neoplastic lesions [20]. This discrepancy may be explained by geographic variations in disease prevalence, genetic susceptibility, dietary patterns, and differences in screening practices and healthcare infrastructure. Higher rates of inflammatory lesions in Indian series likely reflect infectious and nutritional factors, while widespread colorectal cancer screening in developed countries facilitates early detection of premalignant and malignant lesions.

Clinical-pathological correlations: The present study demonstrated strong clinicopathological correlations. Fever, abdominal pain, and chronic diarrhoea were significantly associated with non neoplastic lesions, reflecting their underlying inflammatory and infective aetiologies. In contrast, bleeding per rectum and anaemia were strongly linked to neoplastic lesions, consistent with the pathophysiological mechanisms of mucosal ulceration and chronic blood loss. These findings are in concordance with earlier studies. Shukla KS et al., also identified diarrhoea and rectal bleeding as the most common presenting complaints in LGIT pathology [21]. Interestingly, in the present series, weight loss was more frequently associated with non neoplastic lesions, particularly chronic inflammatory conditions, whereas most studies attribute this symptom predominantly to malignancy. This discrepancy may reflect the prolonged disease course and associated nutritional compromise observed in chronic inflammatory bowel disease in resource-limited settings.

Anaemia was most prevalent among neoplastic cases (52%); however, this association did not reach statistical significance. Nonetheless, this trend supports previous observations that chronic blood loss and nutritional deficiencies play a significant role in the development of anaemia in colorectal malignancies. The presence of anaemia in non neoplastic lesions further underscores the haematological impact of chronic mucosal disease.

Endoscopic-histologic correlation: Endoscopic findings largely mirrored the histopathological spectrum. Non neoplastic lesions most commonly presented with non specific endoscopic features such as oedema and erythema; however, some cases appeared endoscopically normal, underscoring the diagnostic value of biopsy even in subtle or normal-appearing mucosa. Ulceroproliferative growth was a consistent endoscopic feature of malignant lesions, while premalignant lesions predominantly presented as polyps. Nevertheless, the overlap in endoscopic appearances highlights the indispensable role of histopathological examination in establishing a definitive diagnosis.

Diagnostic-therapeutic Implications: The detection of colorectal polyps and inflammatory bowel disease in the present study has important diagnostic and therapeutic implications. Colonoscopic visualisation supported by histopathological evaluation allows precise differentiation between neoplastic, inflammatory, and infectious pathologies. Early identification of polyps enables appropriate risk stratification, timely polypectomy, and structured surveillance to prevent malignant transformation. Similarly, accurate diagnosis of inflammatory bowel disease- particularly ulcerative colitis and Crohn's disease- facilitates differentiation from conditions such as intestinal tuberculosis, thereby guiding appropriate and targeted therapy. These diagnostic insights directly influence therapeutic planning, allowing for individualised treatment strategies, optimised medication selection, and structured follow-up protocols based on disease severity and risk of progression. Ultimately, the combined endoscopic and histopathological approach enhances clinical decision-making, supports evidence-based interventions, reduces long-term complications, and improves overall patient outcomes [22-24].

Limitation(s)

This study was conducted at a single institution, which may limit the generalisability of the findings. Only patients undergoing endoscopy were included, potentially excluding milder or undiagnosed cases. The diagnosis relied solely on histopathological evaluation, without the incorporation of advanced imaging or molecular diagnostic techniques. Additionally, the progression of premalignant or malignant lesions was not assessed, limiting long-term prognostic evaluation.

CONCLUSION(S)

Lower gastrointestinal endoscopic biopsy remains indispensable for distinguishing between benign, premalignant, and malignant lesions. This study highlights the wide histopathological spectrum encountered in LGIT biopsies and reinforces the pivotal role of histopathology in establishing a definitive diagnosis, guiding further investigations, monitoring disease progression, and informing therapeutic decisions. Integration of histological findings with clinical and endoscopic assessments is essential to enhance diagnostic accuracy and ensure optimal patient care.

REFERENCES

[1] Trisal M, Goswami KC, Khajuria A. A study of histopathological spectrum of gastrointestinal endoscopic biopsies in a tertiary care centre. Saudi J Pathol Microbiol. 2018;3(8):226-34.

[2] Maiti B, Bhattacharya S, Roy AD. Histopathological spectrum of upper gastro-intestinal malignancies in endoscopic biopsy and *Helicobacter pylori* status in gastric malignancy. J Evid Based Med Healthc. 2018;5(23):1765-68.

[3] Jaffary M, Ahsen W, Babar MA. Endoscopic assessment of upper gastrointestinal tract lesions among rural community. PJMHS. 2018;12(2):657-59.
[4] Suvernakar SV, More S, Hanmante RD. Histopathological evaluation of lower gastrointestinal tract endoscopic biopsies. IJMSDR. 2020;4(11):10-15.
[5] Colorectal cancer fact sheet. Globocan 2020 Available from:https://gco.iarc.fr/today/data/factsh\eets/cancers/10_8_9-Colorectum-fact-sheet.pdf Last accessed on 2022 Jun 28.
[6] Fact Sheets by Population- India ASRs." Available from:https://gco.iarc.fr/today/data/factsheets/populations/356-india-fact-sheets.pdf Last accessed on 2022 Jun 22.
[7] Bray F, Laversanne M, Sung H, Ferlay J, Siegel RL, Soerjomataram I, et al. Global cancer statistics 2022: GLOBOCAN estimates of incidence and mortality worldwide for 36 cancers in 185 countries. CA Cancer J Clin. 2024;74(3):229-63.
[8] Morgan E, Arnold M, Gini A, Lorenzoni V, Cabasag CJ, Laversanne M, et al. Global burden of colorectal cancer in 2020 and 2040: Incidence and mortality estimates from GLOBOCAN. Gut. 2023;72(2):338-44.
[9] Alghamdi T, Ali MM, Khalaf MA, Ibrahim OM, Alshumrani M. The distribution and histopathological patterns of gastrointestinal tract endoscopic biopsies in Al Baha, Saudi Arabia. J Gastrointest Dig Syst. 2020;10:7.
[10] Hong SM, Baek DH. A review of colonoscopy in intestinal diseases. Diagnostics (Basel) 2023;13(7):1262.
[11] Sharma V, Bansal R, Sharma S, Khare A. Histopathological spectrum with clinical correlation of lower gastrointestinal tract endoscopic biopsies. Int J Clin Diagn Pathol. 2022;5(1):89-93.
[12] Nagtegaal ID, Odze RD, Klimstra D, Paradis V, Rugge M, Schirmacher P, et al; WHO Classification of Tumours Editorial Board. The 2019 WHO classification of tumours of the digestive system. Histopathology. 2020;76(2):182-88.
[13] World Health Organization. Haemoglobin concentrations for the diagnosis of anaemia and assessment of severity. Geneva: World Health Organization; 2011. (WHO/NMH/NHD/MNM/11.1).
[14] Devi B, Letha P, Sapru K. The histopathological spectrum of gastrointestinal endoscopic biopsies in a tertiary care hospital. J Cardiovasc Dis Res. 2024;15(5):904-08.
[15] Yanık S, Akkoca AN, Özdemir ZT, Sözütek D, Yılmaz EE, Sayar S. Evaluation of results of lower gastrointestinal endoscopic biopsi. Int J Clin Exp Med. 2014;7(12):5820-25.
[16] Mishra R, Vahikar S, Shrivastava K, Mitra SK, Mishra V. Histopathological spectrum of gastrointestinal lesions in patients undergoing gastrointestinal endoscopic biopsies- A prospective study. Trop J Pathol Microbiol. 2022;8(1):22-28.
[17] Banstola S, Thapa S, Poudel S, Neupane BR. Histological study of endoscopic biopsies from the lower gastrointestinal tract. J Pathol Nepal. 2022;12(2):1936-39.
[18] Moussa FR, Abd El Gawad W, Nosseir NS, Hassan M. Colonoscopic and histopathological findings in patients with various lower gastrointestinal symptoms: A single-center experience. Suez Canal Univ Med J. 2020;23(1):62-70.
[19] Tahiliani HT, Purohit AP, Desai SC, Jarwani PB. Retrospective analysis of histopathological spectrum of premalignant and malignant colorectal lesions. Cancer Res Stat Treat. 2021;4:472-78.
[20] Ashour GA, Abir AM, Nabeia A. Lower gastrointestinal endoscopy a clinicopathological analysis. Libyan J Med Sci. 2021;5(3):121-24.
[21] Shukla KS, Kshirsagar AY, Shukla DB. Analytical study of colonoscopic findings in a tertiary care centre. J Med Sci Clin Res. 2018;6(1). Doi: 10.18535/jmscr/v6i1.106.
[22] Parajuli P, Poudyal R, Koirala P. Spectrum of lower gastrointestinal disease on colonoscopy and histopathological examination in a tertiary care centre in Biratnagar. J Nobel Med Coll [Internet]. 2025 Sep. 1 [cited 2025 Nov. 30];14(1):87-94. Available from: https://nepjol.info/index.php/JoNMC/article/view/83340.
[23] Chaudhari V. Etiology, clinical picture and diagnosis of lower gastrointestinal bleeding at a tertiary care hospital. Int J Life Sci Biotechnol Pharma Res. 2025;14(3):1433-38. Doi: 10.69605/ijlbpr_14.3.2025.251.
[24] Sulegaon R Shete S, Kulkarni D. Histological spectrum of large intestinal lesions with clinicopathological correlation. J Clin Diagn Res. 2015;9(11):EC30-EC34. Doi: 10.7860/JCDR/2015/14247.6842.

PARTICULARS OF CONTRIBUTORS:
1. Head, Department of Pathology and Laboratory Medicine, Jagjivan Ram Hospital- Western Railway, Mumbai, Maharashtra, India.
2. Consultant Pathologist, Department of Pathology and Laboratory Medicine, Jagjivan Ram Hospital- Western Railway, Mumbai, Maharashtra, India.
3. 3rd Year Resident, Department of Pathology and Laboratory Medicine, Jagjivan Ram Hospital- Western Railway, Mumbai, Maharashtra, India.
4. Consultant Pathologist, Department of Pathology and Laboratory Medicine, Jagjivan Ram Hospital- Western Railway, Mumbai, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. V Kalaivanan,
Department of Pathology and Laboratory Medicine- 1st Floor, Jagjivan Ram Railway Hospital, Behind Maratha Mandir Marg, Mumbai Central, Mumbai-400008, Maharashtra, India.
E-mail: kvanan07@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]
- Plagiarism X-checker: Oct 08, 2025
- Manual Googling: Dec 10, 2025
- iThenticate Software: Dec 16, 2025 (8%)

ETYMOLOGY: Author Origin

EMENDATIONS: 6

AUTHOR DECLARATION:
- Financial or Other Competing Interests: None
- Was Ethics Committee Approval obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Oct 06, 2025**
Date of Peer Review: **Nov 24, 2025**
Date of Acceptance: **Dec 18, 2025**
Date of Publishing: **Jan 01, 2026**