

## Clinical and Radiological Finding with Spectrum of Non-Malignant Lesions of Gastrointestinal Tract

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### ABSTRACT

**Background:** Gastrointestinal tract (GIT) diseases are among the most frequently encountered conditions in clinical practice. Due to its extensive length and complexity, the GIT is prone to a wide spectrum of pathologies, including congenital anomalies, acute and chronic infections, inflammatory disorders, and neoplastic conditions. These lesions may occur in isolation or in combination, affecting different anatomical segments. The present study aimed to evaluate and analyze the clinical and radiological spectrum of non-malignant GIT lesions confirmed histopathologically.

**Methods:** This descriptive, cross-sectional, and analytical study was conducted in the Department of Gastroenterology over one year. A total of 200 cases were included, of which 150 were histopathologically confirmed non-malignant lesions. Detailed clinical and radiological data were collected to aid diagnosis, and specimens (endoscopic biopsies and resected samples) were processed according to standard histopathological protocols.

**Results:** Of the 200 cases, 150 (75%) were non-malignant, while 50 (25%) were malignant. Among the non-malignant cases, 76 (50.6%) were male and 74 (49.4%) female, with a mean age of 48.2 years. The appendix was the most commonly affected organ (73.3%), followed by the large intestine (10.6%) and small intestine (6.0%). The most frequently affected age group was 21–40 years (44%), followed by patients <20 years (22%). Chronic inflammatory lesions were the most common histopathological diagnosis (31.3%), followed by acute on chronic appendicitis (23.3%).

**Conclusion:** A wide spectrum of infectious, inflammatory, and structural lesions can affect the GIT, with the appendix being the most commonly involved site. Accurate clinical, radiological, and histopathological correlation is crucial for early diagnosis and appropriate management, thereby reducing patient morbidity and mortality.

**Keywords:** Gastrointestinal Tract, Non-Malignant Lesions, Inflammatory Bowel Disease, Histopathology, Appendicitis.

## INTRODUCTION

The gastrointestinal (GI) tract is a continuous hollow organ extending from the oral cavity to the anal canal and is a common site for a wide range of pathological processes. Its constant exposure to diverse antigens, microorganisms, dietary elements, and toxins renders it highly susceptible to various disorders including congenital anomalies, infections, inflammatory conditions, polyps, and neoplastic lesions.[1] Vascular lesions of the GI tract such as angiodysplasia, Dieulafoy's lesion, venous ectasias, and telangiectasias are frequently encountered, particularly in association with hereditary hemorrhagic telangiectasia (HHT).[2] Endoscopy plays a pivotal role in the investigation of these conditions, serving both diagnostic and therapeutic purposes. It remains a safe, minimally invasive, and widely accepted procedure, enabling early diagnosis and guiding therapeutic decision-making.[3] Biopsy, however, continues to be the gold standard for definitive diagnosis of GI tract lesions. The spectrum of GI diseases varies by anatomical location. The upper GI tract—including the esophagus, stomach, and duodenum is more prone to infectious, inflammatory, and caustic injuries, along with neoplastic conditions.[4] Conversely, the lower GI tract—comprising the ileum, colon, rectum, and anal canal—commonly presents with infectious colitis, inflammatory bowel disease (IBD), benign and malignant polyps, and other idiopathic conditions.[5] Serious complications such as septicemia, ulceration, intestinal obstruction, and perforation peritonitis can arise if these lesions are not identified and treated promptly. Histopathological evaluation remains crucial in differentiating non-malignant from malignant lesions and in determining specific etiologies such as tuberculosis, Crohn's disease, and eosinophilic enteritis.[6] Timely diagnosis and accurate classification of lesions are vital for preventing disease progression, reducing patient morbidity, and guiding optimal therapeutic interventions. This study was conducted to analyze the clinical and radiological presentation of non-malignant lesions of the GI tract and to correlate them with histopathological findings. By identifying the distribution of lesions with respect to age, sex, and anatomical site, and by evaluating their histopathological patterns, this study aims to contribute to a better understanding of the epidemiology and pathological spectrum of non-malignant GI tract lesions in our setting.

## MATERIALS AND METHODS

The present study was conducted in the Department of Gastroenterology, BSMMU, Dhaka, Bangladesh November 2023 to November 2024. A total of 200 cases were included, of which 150 were histopathologically confirmed non-malignant lesions. All clinically diagnosed non-malignant cases which were confirmed on histopathology were studied. Detailed clinical and radiological history was obtained to aid the diagnosis. All the data was then further analysed. The present work is a descriptive, cross sectional and analytical type of study. All endoscopic biopsies, resected specimens and slides for review were studied. The lesions from the oral cavity (excluding the nasopharynx), oesophagus, stomach, duodenum, ileum, caecum, all the parts of colon, rectum and anal canal were included in the analysis.

The resected specimens were fixed according to standard protocols. Appropriate and adequate sections were taken so as to cover the entire specimen. Lymph nodes wherever possible were resected. All endoscopic biopsies were submitted directly for processing. All the sections were processed under standard guidelines and were stained with hematoxylin and eosin stain and studied under light microscopy. The demographic details, clinical and radiological investigations were obtained from the requisition form, treating physicians and patient file. All the data were statistically analyzed and studied. All malignant lesions were excluded from this study.

**Statistical Analysis:** The data obtained from clinical records, radiological investigations, and histopathological examination were compiled in Microsoft Excel and analyzed using SPSS software,

version 25.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics were applied to summarize the findings. Categorical variables, such as site of lesion, sex distribution, and histopathological type, were expressed as frequencies and percentages, while continuous variables, including age, were represented as mean  $\pm$  standard deviation (SD) with their respective ranges. Comparative statistical tests were employed to determine significant associations between variables. The Chi-square ( $\chi^2$ ) test was used to evaluate the relationship between categorical variables, including lesion site and sex, as well as histopathological diagnosis and age group distribution. The Student's t-test was applied to compare mean age between groups, for example, patients with appendiceal lesions versus those with lesions in other sites. A p-value of  $<0.05$  was considered statistically significant for all comparisons.

## RESULTS

A total of 200 cases were evaluated over the study period, of which 150 (75%) were non-malignant and 50 (25%) were malignant. Only non-malignant cases were included in the present analysis. Table 1 shows the distribution of lesions according to the site of involvement. The appendix was the most frequently affected organ, accounting for 110 cases (73.3%), followed by the large intestine with 16 cases (10.6%) and the small intestine with 9 cases (6.0%). Lesions of the oral cavity, esophagus, and stomach were less common, constituting 5.3%, 3.3%, and 1.3% of cases, respectively. These findings confirm that appendiceal pathology forms the bulk of non-malignant gastrointestinal lesions in surgical specimens.

Table 2 illustrates the age-wise distribution of lesions across different gastrointestinal sites. The highest number of cases was observed in the 21–30-year age group (23.3%), followed by the 31–40-year group (20.6%). Appendiceal lesions predominated in the younger age groups, whereas esophageal and large bowel lesions were more common in patients above 50 years. This pattern reflects the typical age distribution of appendicitis and colonic pathologies reported in the literature.

Table 3 presents the gender distribution of lesions at different sites. Overall, there was a nearly equal male-to-female ratio (1.02:1). Male predominance was observed in oral cavity, esophageal, and small intestinal lesions, whereas females had a slightly higher frequency of appendiceal lesions. The mean age was highest for oral cavity lesions (59.6 years) and lowest for appendiceal lesions (22.9 years), indicating that appendicitis primarily affects a younger population, while oral cavity lesions are seen later in life.

Table 4 summarizes the histopathological spectrum of all cases. Chronic inflammation was the most common finding (31.3%), followed by acute-on-chronic inflammation (27.3%) and acute inflammation (18.0%). Necrosis/gangrene was observed in 7.3% of cases, mostly in the appendix and large intestine, and perforation was reported in 2.6% of specimens. Rare entities included polyps, granulomatous inflammation, eosinophilic inflammation, and vascular lesions. These findings emphasize that inflammatory pathologies are the predominant cause of non-malignant GI lesions in surgical practice.

**Table 1:** Distribution of lesions according to site

Site	Number of Cases	Percentage (%)
Oral cavity	8	5.3
Esophagus	5	3.3
Stomach	2	1.3
Appendix	110	73.3
Small intestine	9	6.0
Large intestine	16	10.6
Total	150	100

Table 2: Distribution of Lesions by Age and Site

Age Group (years)	Oral	Esophagus	Stomach	Appendix	Small Intestine	Large Intestine	Total
<20	1	–	–	29	2	1	33
21–30	–	–	–	31	2	2	35
31–40	–	–	–	27	1	3	31
41–50	1	2	1	8	2	2	16
51–60	2	2	–	9	1	4	18
61–70	2	–	1	4	1	4	12
71–80	1	1	–	2	–	–	4
>80	1	–	–	–	1	–	2
Total	8	5	2	110	9	16	150

Table 3: Distribution of Lesions According to Gender

Site	Male (n=76)	Female (n=74)	Mean Age (years)
Oral cavity	5	3	59.6
Esophagus	4	1	58.7
Stomach	0	2	57.5
Appendix	52	54	22.9
Small intestine	6	3	39.1
Large intestine	9	7	51.7

Table 4: Distribution of Lesions by Histopathological Diagnosis

Diagnosis	Oral	Esophagus	Stomach	Appendix	Small Intestine	Large Intestine	Total
Acute inflammation	1	2	–	21	1	2	27
Chronic inflammation	–	–	1	45	–	1	47
Acute-on-chronic inflammation	–	–	1	35	2	3	41
Necrosis/gangrene	–	2	–	5	2	4	13
Perforation	–	–	–	2	1	1	4
IBD	–	–	–	–	2	–	2
Polyps	–	–	–	–	–	2	3
Obstruction	–	–	–	–	1	2	3
Granulomatous inflammation	–	–	–	1	–	1	2
Eosinophilic inflammation	–	–	–	1	–	–	1
Vascular lesion	3	–	–	–	–	–	3
Epithelial proliferation	4	–	–	–	–	–	4
Other	–	1	–	–	–	–	1
Total	8	5	2	110	9	16	150

## DISCUSSION

The present study comprehensively evaluated the spectrum of non-malignant lesions of the gastrointestinal tract (GIT) with correlation to clinical, radiological, and histopathological findings. Out of 200 total cases, 150 (75%) were confirmed as non-malignant, indicating that benign and inflammatory disorders account for the majority of gastrointestinal pathologies seen in routine practice. In terms of site distribution, the appendix was the most frequently affected organ, comprising 73.3% of all cases (Table 1). This observation is consistent with previous studies, which report appendicitis as the most common cause of acute abdomen worldwide and a leading surgical emergency.[6,7] Our findings also indicate that appendiceal lesions predominantly affect younger patients, with a mean age of 22.9 years, and were particularly common in the <40 years age group (Table 2). This is in agreement with prior reports that appendicitis peaks in the second and third decades of life, highlighting the importance of timely diagnosis and surgical intervention to prevent complications. Lesions of the large intestine were the second most common finding (10.6%), followed by the small intestine (6.0%). Most large bowel lesions occurred in patients between 31–60 years of age, with a mean age of 51.7 years, which is comparable to findings by Sulegaon et al., who observed that non-malignant colonic lesions often occur in middle age.[5] Oral cavity lesions constituted 5.3% of cases, predominantly vascular lesions (lobular capillary hemangiomas) and epithelial proliferative lesions such as pseudoepitheliomatous hyperplasia, typically occurring in older patients (mean age 59.6 years). The gender distribution in our study showed near parity (M:F = 1.02:1), consistent with Shennak et al., who also reported no significant sex predilection for most benign GI conditions.[6] Interestingly, males were slightly more affected by small intestinal and esophageal lesions, whereas females had a marginally higher frequency of appendiceal pathology (Table 3). Histopathologically, chronic inflammation was the most common finding (31.3%), followed by acute-on-chronic inflammation (27.3%) and acute inflammation (18.0%) (Table 4). These patterns reflect the predominance of inflammatory pathologies such as appendicitis, nonspecific enteritis, and colitis in clinical practice. Necrosis and gangrene were identified in 7.3% of specimens, mainly involving the appendix and large intestine, often correlating with clinical presentations of perforation or ischemic changes. Polyps were seen in three cases (2%), most commonly in the large intestine. These included hyperplastic, juvenile, and hamartomatous polyps, a distribution similar to findings by Tony et al., who reported a predominance of colonic polyps in their series.[8] Despite the low number of polypectomy specimens in our study, this highlights the importance of routine colonoscopic surveillance programs to identify polypoidal lesions early and prevent malignant transformation. Two cases of inflammatory bowel disease (IBD) were identified, both involving the ileum. One was diagnosed as ulcerative colitis and the other as indeterminate colitis. This finding is clinically significant as chronic IBD has a well-established risk of dysplasia and colorectal carcinoma, particularly in long-standing disease.[9] Regular surveillance colonoscopy with targeted biopsies is therefore recommended for early detection of dysplastic changes and appropriate surgical intervention when indicated.[10] Granulomatous inflammation was observed in two cases (appendix and large intestine). In countries such as Bangladesh, intestinal tuberculosis remains an important differential diagnosis, and careful distinction between Crohn's disease and tubercular enteritis must be made, as treatment protocols differ significantly.[5] Special stains and microbiological studies are essential in such cases to confirm etiology. Overall, our study highlights that the majority of non-malignant GI lesions are inflammatory in nature, most commonly involving the appendix and colon. The findings underscore the importance of early endoscopic evaluation, histopathological confirmation, and appropriate therapeutic interventions to reduce morbidity and prevent progression to severe complications. Future multicentric studies with larger cohorts and long-term follow-up could provide deeper insights into the natural history and outcomes of these lesions, enabling the development of robust clinical guidelines.

## CONCLUSION

A wide range of non-malignant lesions can affect the GI tract, ranging from benign inflammatory changes to chronic inflammatory disorders like IBD. Histopathological examination remains the gold standard for definitive diagnosis. Early and accurate diagnosis can significantly reduce patient morbidity and prevent progression to more severe disease. Further multicentric studies are warranted to better understand the biological behavior and long-term outcomes of these lesions.

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