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A Study of Histopathological Spectrum of Lower Gastrointestinal Tract Endoscopic Biopsies in a Tertiary Care Centre

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Abstract

Background: Lower gastrointestinal (GI) tract lesions present with a wide spectrum of clinical manifestations. Although endoscopy allows direct visualization of mucosal abnormalities, histopathological examination remains the gold standard for definitive diagnosis.

Objective: To study the histopathological spectrum of lower GI endoscopic biopsies and to correlate histopathological findings with endoscopic diagnosis.

Materials and Methods: This cross-sectional study included 44 patients who underwent lower GI endoscopy followed by biopsy. Clinical details, endoscopic findings, and histopathological features were analyzed using routine hematoxylin and eosin staining.

Results: The majority of lesions were non-neoplastic (90.9%), with ulcerative colitis being the most common diagnosis. Neoplastic lesions constituted 9.1% of cases, predominantly adenocarcinoma.

Conclusion: Histopathological examination of lower GI endoscopic biopsies is indispensable for accurate diagnosis and appropriate management.

Keywords: Lower gastrointestinal tract, Endoscopic biopsy, Histopathology, Neoplastic, Non-neoplastic

Introduction

Lower gastrointestinal tract disorders constitute a significant proportion of clinical presentations in gastroenterology practice. Patients commonly present with symptoms such as abdominal pain, diarrhea, bleeding per rectum, constipation, and altered bowel habits. These symptoms may result from a wide range of pathological processes including inflammatory, infective, ischemic, and neoplastic conditions. Endoscopy has emerged as a cornerstone in the evaluation of lower GI diseases as it allows direct visualization of the mucosa and facilitates targeted biopsy. However, endoscopic appearance alone may

not always be sufficient for definitive diagnosis due to overlapping features among various disease entities. Histopathological examination of endoscopic biopsies provides essential information regarding the nature and extent of disease and helps in differentiating between non-neoplastic and neoplastic lesions. In developing countries like India, the burden of inflammatory bowel disease and colorectal malignancies is increasing, necessitating detailed clinicopathological correlation. The present study was undertaken to analyze the histopathological spectrum of lower GI endoscopic biopsies in a tertiary care centre.

Materials and Methods

This descriptive cross-sectional study was conducted in the Department of Pathology at a tertiary care hospital. A total of 44 patients who underwent lower GI endoscopy and biopsy were included in the study. Relevant clinical details such as age, sex, presenting complaints, and endoscopic findings were recorded. Biopsy specimens obtained during endoscopy were fixed in 10% buffered formalin, processed routinely, and embedded in paraffin. Sections of 3–5 µm thickness were stained with hematoxylin and eosin. Special stains were applied wherever indicated. The histopathological findings were analyzed and correlated with endoscopic diagnosis.

Results

The study population included patients ranging from 3 to 79 years of age with a male predominance.

Table 1: Age-wise distribution of study population (n=44)

S.N	Age Group	No. of cases	Percentage (%)
1.	≤10 Years	1	2.3
2.	11-20 Years	9	20.5
3.	21-30 Years	11	25.0
4.	31-40 Years	3	6.8
5.	41-50 Years	8	18.2
6.	51-60 Years	6	13.6
7.	61-70 Years	3	6.8
8.	71-80 Years	3	6.8
Mean age±SD (Range) years Median age [Interquartile range]		38.43±19.36 (3-79) 31.5 [22.25, 51.75]	

Table 2: Distribution of cases according to clinical complaints

S.N	Clinical complaints	No. of cases	Percentage (%)
1.	Abdominal pain	21	47.7
2.	Blood in stool	19	43.2
3.	Diarrhea	9	20.5

4.	Anemia	3	6.8
5.	Constipation	2	4.5
6.	Weight loss	2	4.5
7.	Others (2 each Abdominal distension, Hematochezia and vomiting and 1 each IBD symptoms and Progressive dysphagia)	8	18.2

Table 3: Distribution of cases according to lesion involving site

S.N	Site	No. of cases	Percentage (%)
1.	Colon	15	34.1
2.	Rectum	11	25.0
3.	Ileum	6	13.6
4.	Caecum	3	6.8
5.	Multiple sites (Rectum and colon – 6, Ileum and caecum – 2, Ileum and colon – 1)	9	20.5

Table 4: Distribution of cases according to Endoscopic Diagnosis

S.N	Endoscopic Diagnosis	No. of cases	Percentage (%)
1.	Erythematous mucosa	20	45.5
2.	Ulcer	7	15.9
3.	Stricture	7	15.9
4.	Ulcerated mucosa	6	13.6
5.	Mass	3	6.8
6.	Polyp	1	2.3

Table 5: Distribution of cases according to Histopathological Diagnosis

S.N	Histopathological diagnosis	No. of cases	Percentage(%)
A.	**Non-neoplastic**	**40**	**90.9**
1.	Ulcerative colitis	20	45.5
2.	Crohn's disease	7	15.9
3.	Chronic non-specific colitis	6	13.6
4.	Infective colitis	5	11.4
5.	Ileal/Intestinal tuberculosis	2	4.5
B.	**Neoplastic**	**4**	**9.1**
1.	Tubercular adenoma (Benign)	1	2.3
2.	Adenocarcinoma of rectum (Malignant)	3	6.8

Table 6: Correlation of histopathological spectrum of lower GI endoscopy with endoscopic findings

S.N	Clinical Finding	HPE Spectrum						Statistical Significance
		Ulcerative colitis (n=20)	Crohn's disease (n=7)	Chronic non- specific colitis (n=6)	Infective colitis (n=5)	Ileal/ Intes-tinal TB (n=2)	Neo-plastic lesions (n=4)	
1.	**Site**							
	Colon	6 (30.0%)	2 (28.6%)	1 (16.7%)	1 (20.0%)	2 (100.0%)	3 (75.0%)	x^2=33.656; p=0.029
	Caecum	0	0	2 (33.3%)	1 (20.0%)	0	0	
	Ileum	0	3 (42.9%)	1 (16.7%)	2 (40.0%)	0	0	
	Rectum	8 (40.0%)	1 (14.3%)	0	1 (20.0%)	0	1 (25.0%)	
	Multiple	6 (30.0%)	1 (14.3%)	2 (33.3%)	0	0	0	
2.	**Size**							
	≤2 cm	9 (45.0%)	4 (57.1%)	5 (83.3%)	2 (40.0%)	2 (100.0%)	1 (25.0%)	x^2=33.656; p=0.029
	>2 cm	11 (55.0%)	3 (42.9%)	1 (16.7%)	3 (60.0%)	0	3 (75.0%)	
3.	Multiple lesions	14 (70.0%)	3 (42.9%)	5 (83.3%)	2 (40.0%)	1 (50.0%)	2 (50.0%)	

Involvement of colon was higher as compared to other site i.e Ileum, caecum, rectum both in neoplastic & non-neoplastic lesion (p=0.029).

Table 7: Correlation of histopathological spectrum of lower GI endoscopy with endoscopic diagnosis

S.N	Clinical Finding	HPE Spectrum						Statistical Significance
		Ulcerative colitis (n=20)	Crohn's disease (n=7)	Chronic non-specific colitis (n=6)	Infective colitis (n=5)	Ileal/ Intes-tinal TB (n=2)	Neo-plastic lesions (n=4)	
1.	Erythematous mucosa	19 (95.0%)	0	1 (16.7%)	0	0	0	x^2=159.0; p<0.001

2.	Mass	0	0	0	0	0	3 (75.0%)
3.	Polyp	0	0	0	0	0	1 (25.0%)
4.	Stricture	0	7 (100%)	0	0	0	0
5.	Ulcer	0	0	0	5 (100%)	2 (100%)	0
6.	Ulcerated mucosa	1 (5.0%)	0	5 (83.3%)	0	0	0

Endoscopic finding of erythematous mucosa, showed a significant association with ulcerative colitis; stricture showed a significant association with Crohn's disease, ulcerated mucosa showed a significant association with chronic non-specific colitis, ulcer showed a significant association with infective colitis and ileal/intestinal tuberculosis while presence of mass/polyp showed a significant association with neoplastic lesions ($p<0.001$).

The most common presenting symptoms were abdominal pain, bleeding per rectum, and diarrhea. Colon and rectum were the most frequently involved sites. Majority of cases showed multiple lesions with lesion size less than 2 cm. Endoscopically, erythematous mucosa, ulcers, and strictures were the most common findings. Histopathological examination revealed that 90.9% of lesions were non-neoplastic, while 9.1% were neoplastic. Ulcerative colitis was the most common diagnosis followed by Crohn's disease and chronic non-specific colitis. Among neoplastic lesions, adenocarcinoma was the predominant malignancy. A significant correlation was observed between endoscopic findings and histopathological diagnosis.

Discussion

Lower GI endoscopic biopsy plays a pivotal role in establishing a definitive diagnosis. In the present study, non-neoplastic inflammatory lesions constituted the majority of cases, similar to findings reported in other Indian studies. Ulcerative colitis emerged as the most common diagnosis, reflecting the increasing burden of inflammatory bowel disease. Neoplastic lesions were less frequent but clinically significant, emphasizing the importance of early detection. Histopathological evaluation remains crucial in differentiating between inflammatory, infective, and neoplastic conditions, especially when endoscopic findings are non-specific. The correlation between endoscopic and histopathological findings underscores the need for routine biopsy in suspected lower GI lesions.

Conclusion

A total of 44 cases were analyzed, with patients spanning a wide age range (3 to 79 years) and showing male predominance.

The most frequent presenting complaints were abdominal pain and rectal bleeding. Colon and rectum were the most commonly involved anatomical sites. Following were the key findings of the study:

Histopathological examination revealed a significant predominance of non-neoplastic lesions (90.9%), most notably ulcerative colitis (45.5%), followed by Crohn's disease (15.9%), chronic non-specific colitis

(13.6%) and infective colitis (11.4%). Neoplastic lesions were less, constituting only 9.1% of cases, of total adenocarcinoma were the most common finding among all malignant lesion. No statistically significant association was found between histopathological categories and demographic variables like age or sex. Involvement of rectum and colon was most common site associated with non-neoplastic lesions as compared to neoplastic lesion A robust correlation was observed between specific endoscopic findings and histopathological diagnoses ($p<0.001$). Erythematous mucosa and ulcerated mucosa were significantly associated with ulcerative colitis, while strictures correlated well with Crohn's disease. Mass and polyp findings on endoscopy were predictive of neoplastic lesions.

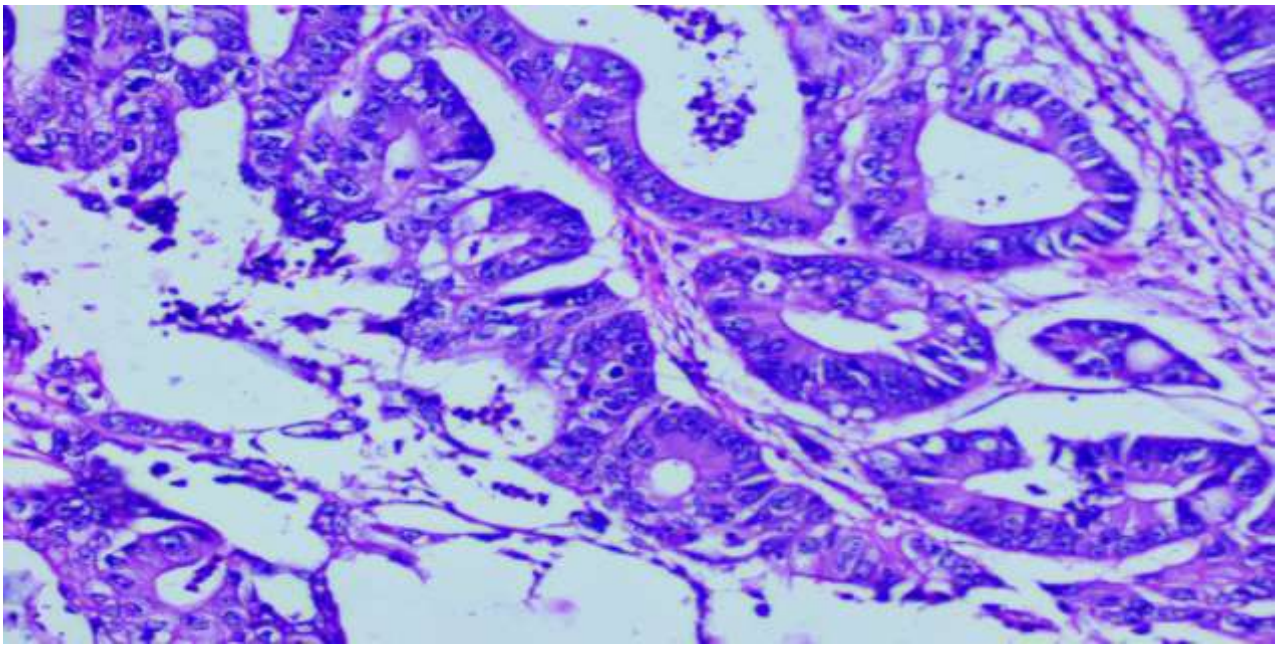

Plate 01: Carcinoma Rectum (H&E 20x)

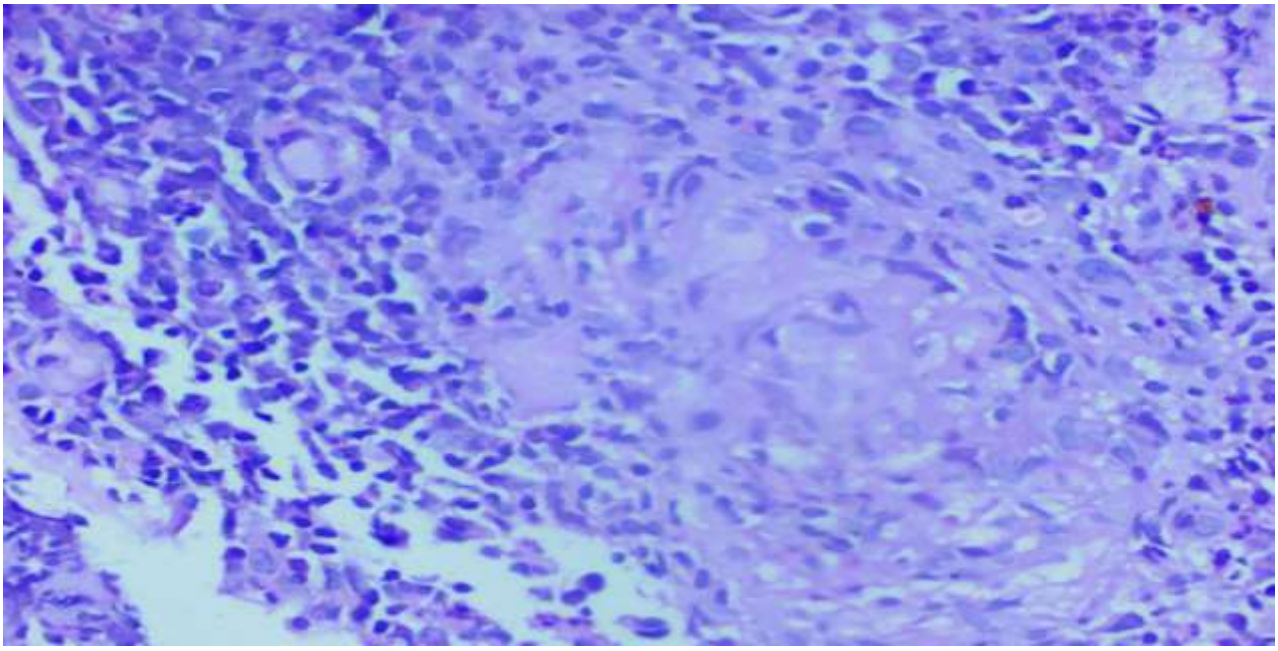

Plate 02: Crohn's Disease (H&E 40x)

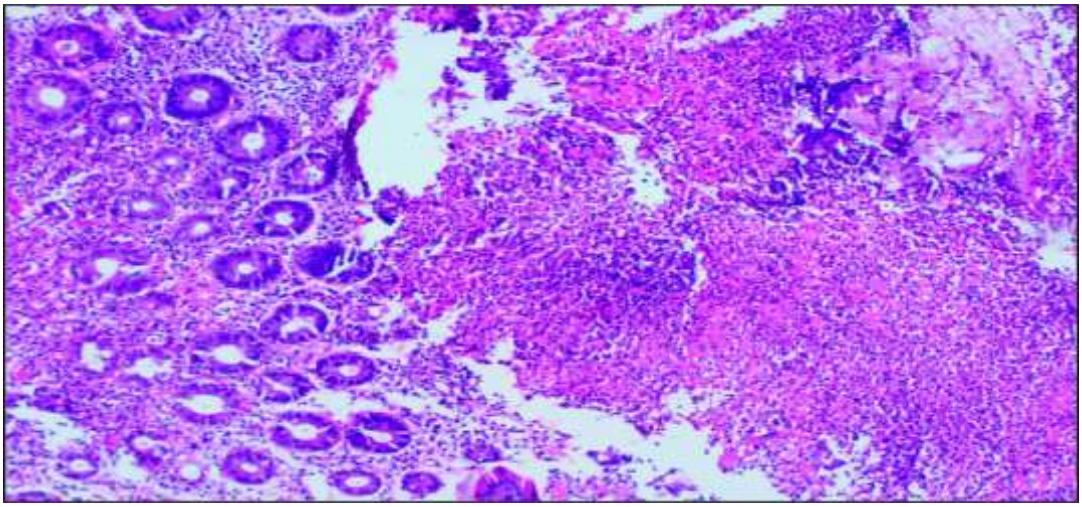

Plate 03: Infective Colitis (H&E 10x)

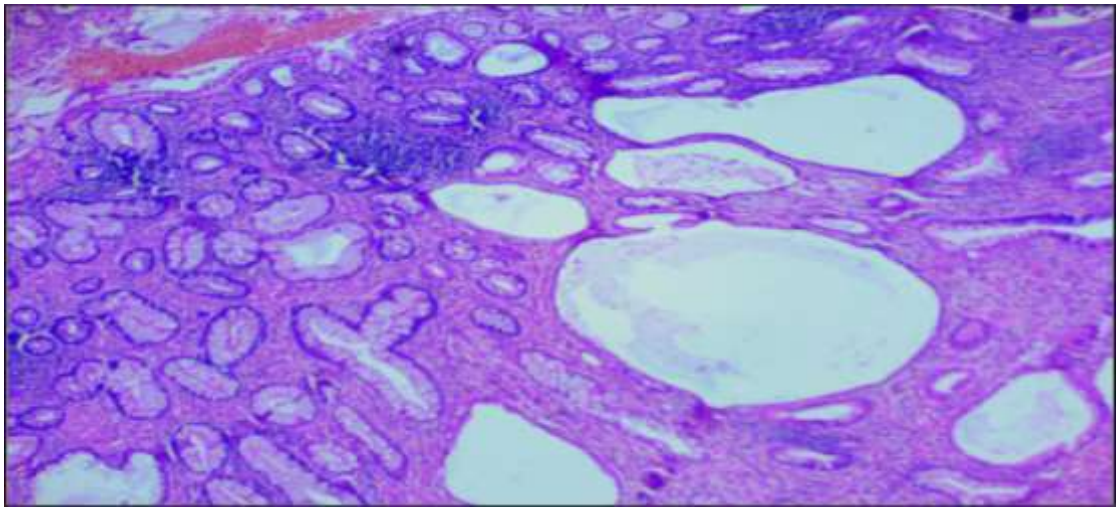

Plate 04: Tubular Adenoma (H&E 4x)

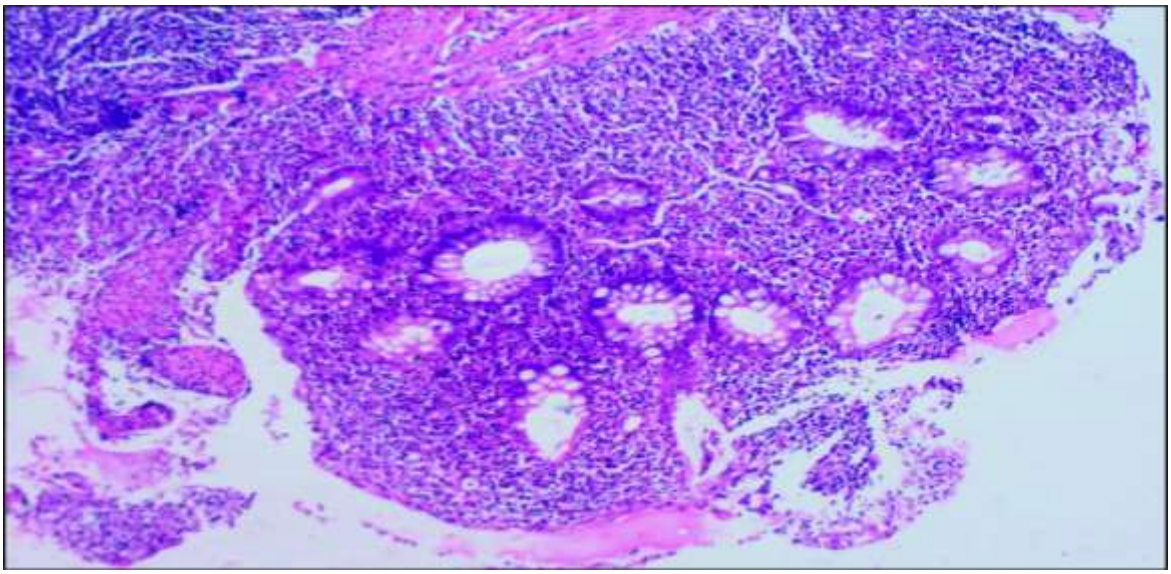

Plate 05: Ulcerative Colitis (H&E 10x)

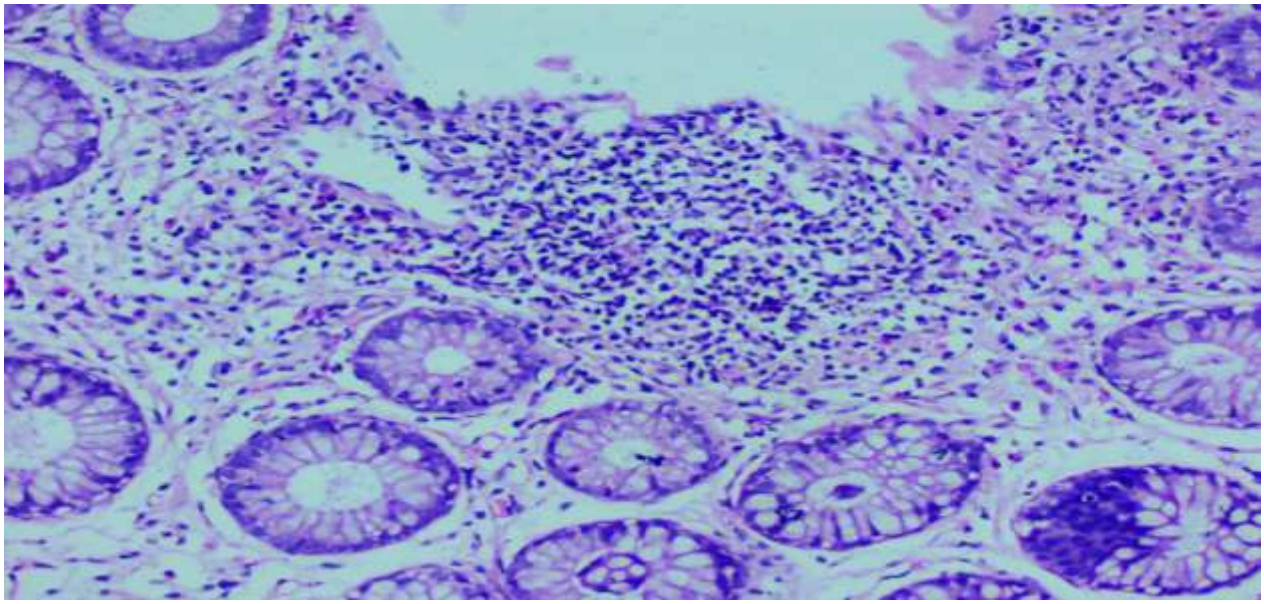

Plate 06: Chronic Non-specific Colitis (H&E 20x)

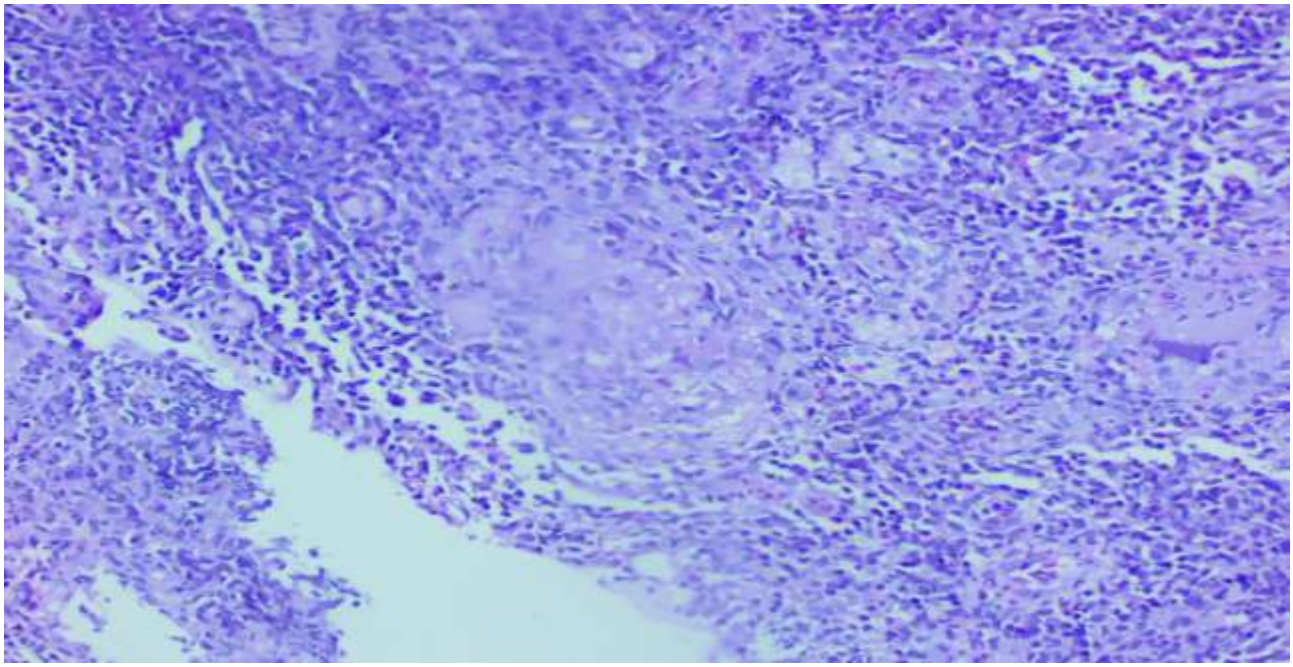

Plate 07: Intestinal TB (H&E 20x)

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