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Lower Gastro-Intestinal Tract (LGIT) Mucosal Biopsies –Clinicopathological Correlation

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ABSTRACT

Endoscopy of the GI tract is a simple, safe and well tolerated procedure. Endoscopic evaluation in combination with biopsy is an important investigative tool in the early diagnosis of whole GI tract neoplasms and lesions. There are relatively fewer studies on this anatomical region and hence this study was done with an aim to study the clinicopathological correlation of Lower Gastrointestinal Tract (LGIT) Mucosal Biopsies.A retrospective study of 70 lower GI endoscopic mucosal biopsies was carried out at TMMC and RC over 2 years period. The study period was from April 2019 to April 2021. Of the 70 patients, 48 (67%) were males and 22 (33%) were females, giving a male to female ratio of 2:1 approximately. The 3 most common sites of biopsy were colon > rectum > multiple sites. Of the pathological lesions diagnosed, inflammatory lesions were the most common (n = 18, 25.7%). (n = 9, 12.8%) of the cases were found to be malignant and his to logically (n = 10, 14.3%) of biopsies showed normal histology. The combined modality approach of using clinical data, endoscopic evaluation and histopathological examination allows for accurate identification of the lesions of lower gastro-intestinal tract with reasonable accuracy.

INTRODUCTION

World over, colorectal cancer stands as 4th most common cancer - having an incidence rate of 9.8%[1,2]. Colonoscopy as a diagnostic tool for colonic pathology, offers greater detection capability than barium enema or CT for lesions such as colitis, polyps and cancer[3].

The American Cancer Society has established screening guidelines and testing schedules to find colon polyps and cancer[4]. Regular bowel cancer screening reduces cancer mortality risk by as much as 16% - hence the importance of screening programs. Adenocarcinoma is the commonest malignancy histologically, with peak incidence in 60 to 70 years age group. TNM (tumor-nodes-metastasis) classification and staging system enlists depth of invasion and lymph node metastasis as the two most important prognostic factors[5].

Endoscopic biopsy examination together with histo-pathological assessment stands to be the current gold standard to accurately and objectively assess the patients.

Clinical Presentation: The chief complaints were - abdominal pain, bleeding per rectum, constipation and/or diarrhea. The duration of complaints varied from case to case - ranging from 1 month to even 2 years in some cases. Some of the patients presented with abnormal radiographic reports – suspicious abdominal mass on radiographic scans, positive stool occult blood test and suspicious findings on barium studies.

MATERIALS AND METHODS

The present study was undertaken to evaluate endoscopic mucosal biopsies from lower GI tract (LGIT) from patients attending the department of gastroenterology at TMMC and RC over a 2 year period from April 2019 to April 2021. A total of 70 cases of endoscopic mucosal biopsies were evaluated. Fixation of the biopsy specimens was done in 10% buffered formalin which was followed by automated tissue processing and embedding in paraffin. Serial sections of 3-5 micrometer thickness, were prepared and then stained with routine Hematoxylin and Eosin stain with additional sections being stained with Per-iodic Acid Schiff (PAS) stain, wherever necessary.

Inclusion criteria: Endoscopic mucosal biopsies from 2nd part of duodenum to anal canal.

Exclusion Criteria: Samples not received in formalin and improperly fixed specimens, Autolysed samples.

Stains: H and E stain and Per-iodic acid Schiff (PAS).

RESULTS AND DISCUSSIONS

In our study, 70 LGE biopsy specimen records were retrospectively analyzed. On histological evaluation,

Lesion	Number of Cases	
INFLAMMATORY LESIONS		25.7 %
Chronic non-specific colitis/proctitis	10	
Focal active colitis	8	
INFLAMMATORY BOWEL DISEASE		18.6 %
Ulcerative Colitis	7	
Cohn's Disease		6
POLYPS (Figure 2)		21.4 %
Adenoma(tubulo villous)	1	
Adenomatous polyp	5	
Retention Polyp	5	
Hyperplastic polyp	1	
Inflammatory Polyp	3	
MISCELLANEOUS	5	7.2 %
UNREMARKABLE/NORMAL HISTOLOGY	10	14.3 %
MALIGNANCY		12.8 %
Colon Adenocarcinoma	3	
Rectum Adenocarcinoma	4	
Anal Mucosa Adenocarcinoma	1	
D3 - Suspicious For Adenocarcinoma	1	
TOTAL	70	100%

Microscopic Diagnosis	Endoscopic Appearance
Chronic Non-Specific Colitis/Proctitis, Focal Active Colitis	Inflamed Mucosa, Multiple Ulcers
Inflammatory Bowel Disease	Mucosal Ulcerations, granularity and erosions, strictures
Polyps	Polypoidal growth, Mucosal Polyp
Malignancy	Ulceroproliferative growth, friable growth +/- stricture across which scope couldn't be negotiated
Unremarkable/Normal Histology	Normal colonoscopic study, mucosal edema and/or hyperemia

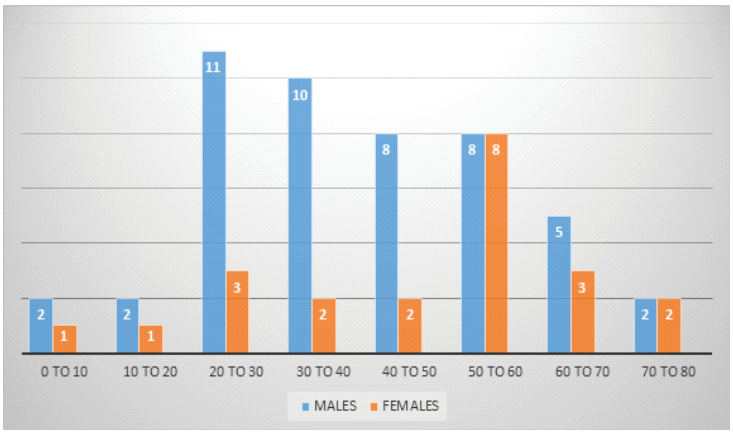
Present study	In agreement with study by
Number of Non neoplastic lesions> Number of neoplastic lesions	Azar Qayyam *et al*[8]
Adenocarcinoma : Fifth decade most common, Males > Females	Thomas *et al*.
Moderately differentiated adenocarcinoma – maximum cases	Janasson *et al*. and Rangaswami *et al*.
Malignant cases percentage (12.8%)	Sahu *et al*. in India (8.3%)[6]
Colorectal adenocarcinoma anal mucosa adenocarcinoma (1.2 : 1):	Abdulkareem *et al*. (1.35 : 1)[7]

(n = 60, 85.7%) of the endoscopic biopsies had pathologic diagnosis while (n = 10, 14.3%) of them showed normal mucosal histology. Of the 70 patients, n = 48 (67%) were males and n = 22 (33%) were females, giving males to females ratio of 2:1. The age range analyzed was from 5 months to 78 years, giving a mean of 41.5 years. The median age was 45 years. (Graph 1)

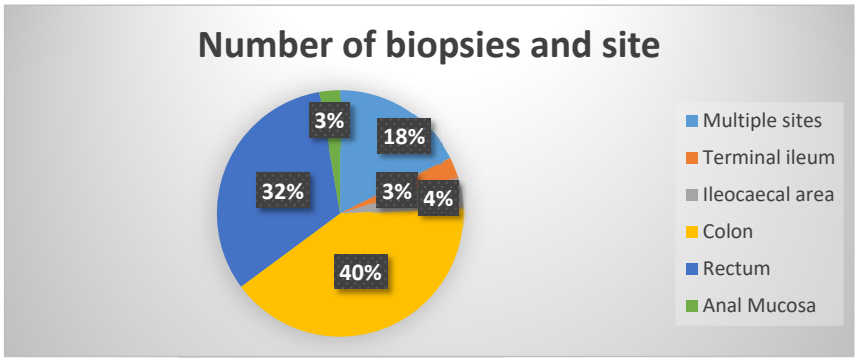
The 3 most common biopsy sites were as follows colon > rectum > multiple sites, followed by ileocaecal area, and 2 biopsies each from terminal ileum and anal mucosa.

Of the pathological lesions diagnosed, inflammatory lesions were the most common (n = 18, 25.7%) followed in order by polyps (n = 15, 21.4%), IBD (n = 13, 18.6%), malignancy (n = 9, 12.8%) and miscellaneous (n = 5, 7.2%). (n = 10, 14.3%) of the biopsies showed normal histology.

Miscellaneous lesions comprised of n = 1 case each of Hirschsprung disease, collagenous colitis, evolving collagenous colitis and n = 2 cases of perforation.



Graph 1: Distribution of number of cases by age and sex



Graph 2: Number of biopsies according to site

There are relatively fewer studies published on this anatomical region and hence the importance of this study.

Study series by Azar *et al.*[8] showed maximum cases of non-neoplastic lesions, followed by neoplastic lesions and normal biopsies - in accordance with the present study

Microscopic Features of Non-Neoplastic Lesions: In the present study, 61 cases were of non- neoplastic etiology.

- Eighteen Cases were of chronic non-specific colitis/proctitis and Focal active colitis characterized microscopically by well-preserved mucosal glands' architecture, normal density of goblet cells, and predominantly lymphoplasmacytic inflammatory infiltrate in lamina propria.
- Fifteen cases were diagnosed as polyps which microscopically showed superficial serrated architecture - with absence of atypia, abundance of dilated glands and oedematous lamina propria.
- Thirteen cases were diagnosed as inflammatory bowel disease – with 7 cases of Ulcerative colitis and 6 cases of Crohn's disease.

Ulcerative colitis mostly showed distortion of glandular pattern, increase in the number of mixed inflammatory cells in the lamina propria, crypt abscesses, cryptitis and reduced number of goblet cells.

Cases, on treatment, were characterized by regenerative changes of crypts, restoration of goblet cell population, reduction in the lymphoplasmacytic inflammatory cell infiltrate together with reduced number of polymorphs and/or crypt abscess.

Ulcerative Colitis: Cases of Crohn's disease were characterized by presence of multiple granulomas, foreign body type giant cell reaction and lymphocytic infiltrate in the mucosa and submucosa (Fig. 1).

- One case of Hirschprung disease was diagnosed, microscopically characterized by mild nerve bundle hypertrophy in the myenteric plexus along with absence of ganglion cells.

Features of Neoplastic Lesions : Sahu *et al*. in India had only 8.3% cases of LGIT malignancies[6]. which is quite close to our studys' finding of 12.8%.

Adenocarcinoma is the most common malignant tumor of LGIT (Fig. 3). In the present study, a total of

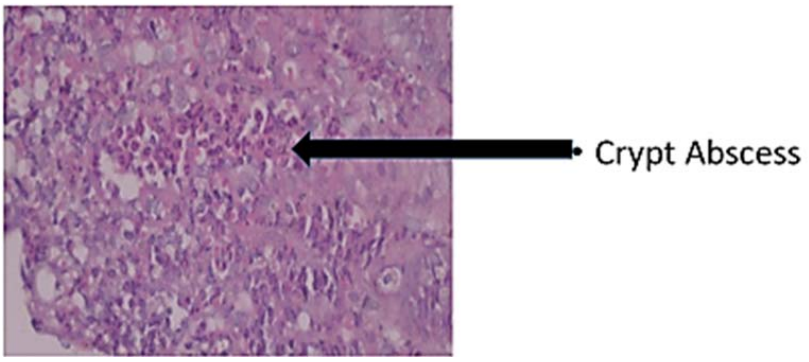


Fig. 1: case of crohn's disease showing crypt abscess

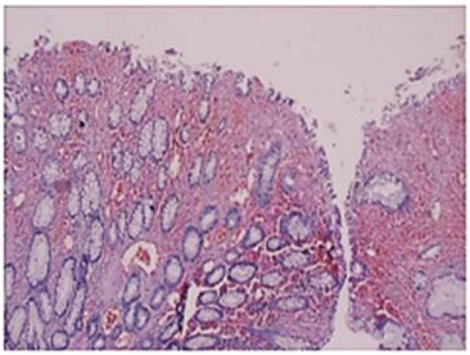


Fig. 2: LGIT polyp

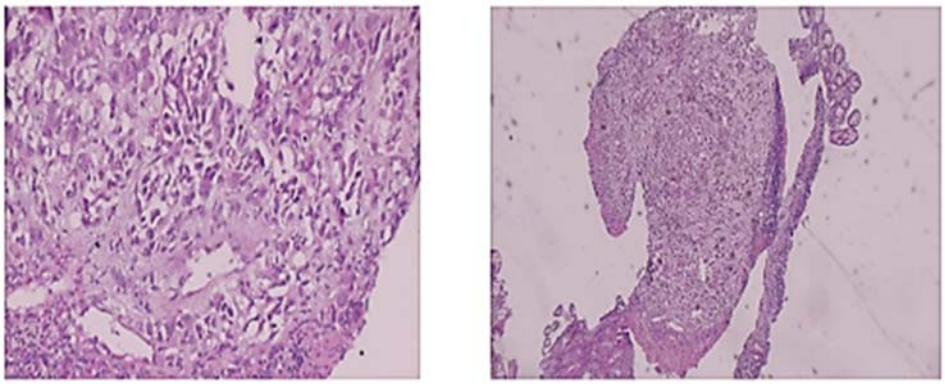


Fig. 3: Adenocarcinoma of colon

(n = 9, 12.8%) malignant cases were detected, maximum being moderately differentiated histologically, in agreement to studies by Janasson *et al*. and Rangaswami *et al.* whose study also showed maximum cases of moderately differentiated adenocarcinoma.

Colorectal carcinoma increases in frequency with increasing age -the average age at the time of diagnosis being fifth decade and it is more common in males. These findings were in accordance with studies done by Thomas *et al*.

The males to females ratio of patients with colorectal and anal mucosa adenocarcinoma of present study is 1.2:1 and is in the same range of study by Abdulkareem *et al*. who had males to females ratio of 1.35:1[7]. The males to females ratio in present study is similar to various other studies in the Western world[2].

CONCLUSION

Histopathological study of the endoscopic biopsies should be done in correlation with clinical and radiological features/data, this helps in accurate assessment of mucosal lesions and diagnosis of the carcinomas at early stage, which may help in appropriate and early management of the cases.

Endoscopy in combination with biopsy and clinical data has proved to be a powerful diagnostic tool for better patient management.

Endoscopic biopsy can be used for follow up of inflammatory diseases like ulcerative colitis and Crohn's disease and in defining the epithelial dysplasia that may help in the early detection of malignant lesions. Endoscopic screening may help in detection of advanced colonic neoplasms in asymptomatic adults.

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