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Histopathological Study of Endoscopic Lower Gastrointestinal Tract Biopsies

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Abstract
Background:- *Colonoscopy is a simple, safe and well tolerated procedure, the visualization of the mucosa of the entire colon and terminal ileum to detect intestinal abnormalities and obtain biopsy leads to the early detection of the pathologic process. Colonoscopy is considered gold standard for cancer surveillance, which is the third prevalent cancer in men and women.*
Objective*:-*
(1)To determine the spectrum of histopathological lesion of lower gastrointestinal tract.
(2) To establish colonoscopic biopsies as an effective tool in proper diagnosis of various lower gastrointestinal tract lesions.
Materials and methods*:-*
A retrospective study was conducted at the Department of Pathology, Smt. NHL Municipal Medical College. All 213 colonoscopic biopsies were examined and recorded clinical data using pre-designed proforma. These biopsies were examined by routine histopathology methods.
Results:-
A total of 213 colonoscopic biopsies were studied. A higher frequency of colonic disease were in males with a male to female ratio of 1.4:1 and age range of 2 years to 90 years was observed. The most common histopathological diagnosis was chronic non-specific colitis with ulceration.
Conclusion:-
Colonoscopy is incomplete without biopsy and histopathology is the gold standard for diagnosis of colorectal lesions. Colonoscopic biopsies also play a key role not only in diagnosis, but also in follow up and treatment. Colonoscopic screening can detect early colonic neoplasm in asymptomatic patients.

Keywords: *colonoscopy, biopsy, histopathology, adenocarcinoma*

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I. Introduction

The colon and rectum accounted various diseases which include non- neoplastic and neoplastic conditions. It can be sites for infections, inflammatory bowel diseases, vascular disorders, motor and mechanical conditions and various neoplasm.[1] The development of flexible endoscopes has led to a great increase in the examination and mucosal biopsy evaluation of all portions of the large intestine and sometimes terminal ileum.[2]

The various conditions of colon are segregated for diagnosis on the basis of four main categories like mucosal architecture, lamina propria cellularity; inflammatory cells infiltration and epithelial abnormalities.[3] Biopsies are sought for specific diagnosis for determining the extent of disease and its response to therapy and for detecting complication.

Colonoscopic biopsy provides the first source of tissue for most cases of colorectal carcinoma and therefore might become an important source for histopathological examination. Colonoscopic mucosal biopsies have shown to be most accurate indicator of the extent of involvement of the colon in inflammatory bowel disease. Colonoscopy is currently considered to be gold standard for cancer surveillance.[4]

This study was undertaken to highlight the utility of colonoscopic biopsies in diagnosis of conditions affecting the lower gastrointestinal tract ranging from inflammatory to neoplastic, along with simultaneous evaluation of clinical data.

II. Materials And Methods:

The present study was undertaken in the Department of Pathology of Smt. NHL Municipal Medical College. A total number of 213 colorectal biopsies received were studied. All the colonoscopic biopsy specimens were immediately fixed in10% formalin for 24 hours. It was then routinely processed and stained

with Haematoxylin and Eosin stain. Detailed study was performed under the light microscope. Moreover, age, sex and the positive endoscopic findings related to the patients were also recorded in the proforma.

Biopsies of adequate size and from the representative sites were included in the study. Similarly, inadequate biopsies were excluded from the study. An attempt was made to correlate the colonoscopic diagnosis with histopathological diagnosis.

III. Results

During the study period, 213 colonoscopic biopsy specimens were examined histopathologically with assessment of clinical data.

Table 1: distribution of site of biopsy

Site of biopsy	No. of cases
Small intestine	20
Large intestine	
- Left sided colon	151
-Right sided colon	42
Total no. of cases	213

Out of 213 cases, 20 cases were from small intestine and 193 cases were from large intestine. In our study, number of cases of left sided colonic biopsy is higher than the cases of right sided colonic biopsy.

Table 2: Age and sex distribution of all cases

Age group (years)	Male (No. of cases)	Female (No. of Cases)	Total (No. of Cases)
0-10	2	1	3
11-20	7	10	17
21-30	23	15	38
31-40	16	9	25
41-50	30	14	44
51-60	22	20	42
61-70	21	12	33
71-80	2	6	8
81-90	2	1	3
Total	125	88	213

The age of the patients was ranging from 2 years to 90 years of age. Maximum cases were in the age group of 41-60 years. A higher frequency of colonic diseases was found in males with a male to female ratio of 1.4:1.

Table 3: Distribution of colonoscopic lesions

Diagnosis		Total no of cases
Non neoplastic		
	Non specific colitis with ulceration	120
	Inflammatory bowel disease	42
	Tuberculous inflammation	8
	Solitary rectal ulcer syndrome	9
	Inflammatory Polyp	3
	Amoebic colitis	5
Neoplastic		
	Adenocarcinoma	19
	Adenomatous polyp	
	-Tubular adenoma	5
	-Villous adenoma With high grade dysplasia	2
Total		213

In our study, 187 cases were diagnosed as Non-neoplastic lesions and 26 cases were diagnosed as neoplastic lesions. In the present study of 213 colonoscopic biopsies, 120 cases were of non-specific colitis which is the most common diagnosis. The second common cases were of inflammatory bowel disease.

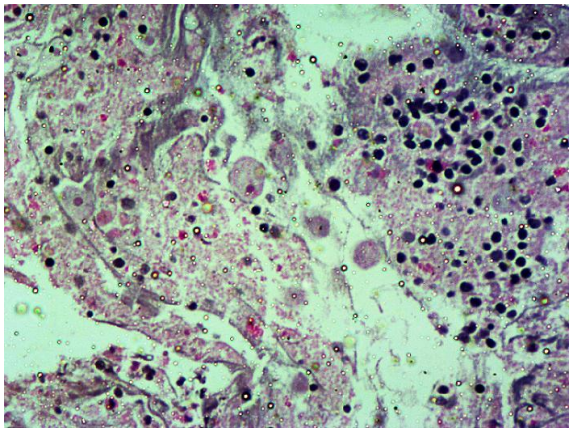

Figure 1 : Amebic colitis

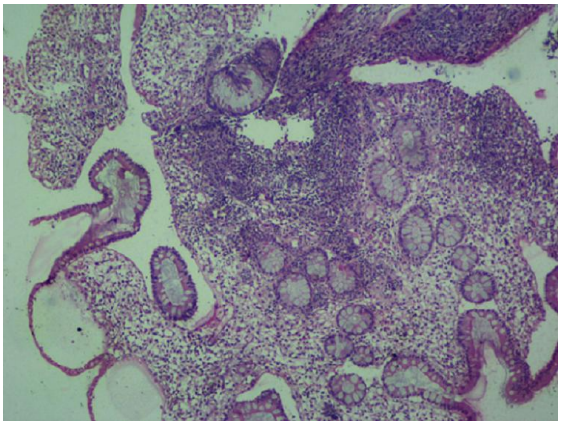

Figure 2: Diffuse active colitis

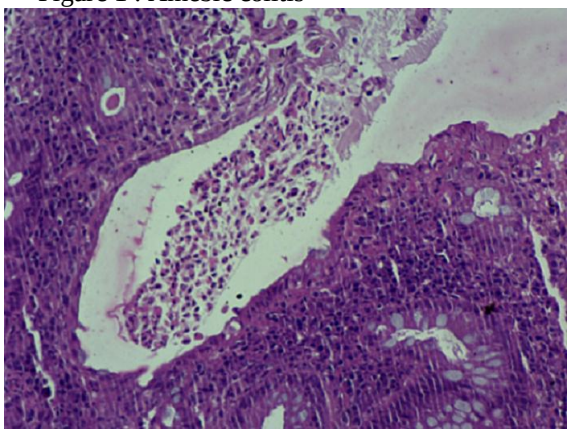

Figure 3: Crypt abscess

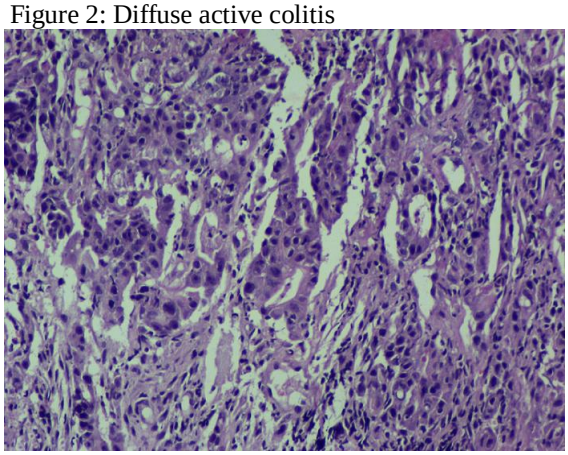

Figure 4: Moderately differentiated Adenocarcinoma of colon

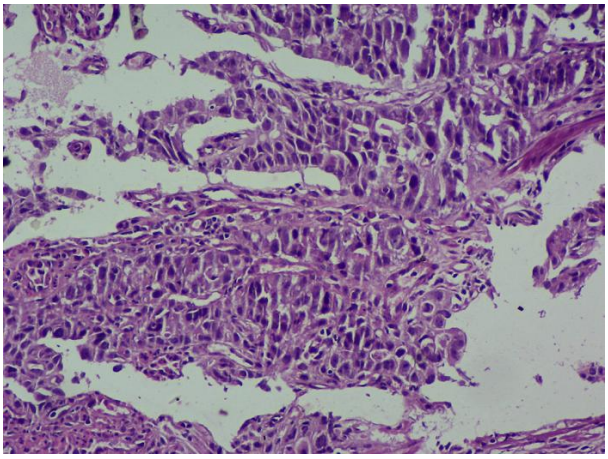

Figure 5: Poorly differentiated adenocarcinoma of colon

Table 4: Distribution of Inflammatory bowel disease lesions

Diagnosis	**Lesions**	**Total no of cases**
Inflammatory bowel disease		
Ulcerative colitis	Acute ulcerative colitis	33
	Chronic ulcerative colitis	2
	Chronic UC with Pseudopolyposis	2
Crohn's disease		5
Total cases		42

In our study, 42 cases (20% of total colonoscopic biopsies) were of inflammatory bowel disease. Ulcerative colitis was predominantly seen in 88% among these biopsies while Crohn's disease was significantly less seen in 12% of these biopsies.

Table 5 : Histopathological features of Ulcerative colitis

Histopathologic features	Number of cases
Crypt architecture	
-Normal	1
-Mild distortion	10
-Moderate distortion	12
Goblet cells	
-Depleted	20
-Preserved	13
Basal plasmacytosis	
-Present	26
-Absent	7
Cryptitis	
-Present	33
-Absent	-
Crypt abscesses	
-Present	27
-Absent	6
Lymphoid follicles	
-Present	4
-Absent	-
Muscularis mucosal hypertrophy	
-Present	3
-Absent	1
Pseudopolyps	
-Present	2
-Absent	2

There were a total of 42 cases of IBD diagnosed in this study accounting for 20% of the pathological lesions diagnosed. Of these 42 cases, 37 were of Ulcerative colitis and 5 were of Crohn's disease. Ulcerative colitis is the most frequently diagnosed IBD in this study.

Ulcerative colitis classically shows a diffuse and continuous chronic inflammation without skip areas. Microscopic diagnosis of Ulcerative colitis is based on wide spread crypt architectural distortion, a diffuse transmucosal inflammatory infiltrate with basal plasmacytosis, eventually associated with an active component, causing cryptitis and crypt abscesses formation. Goblet cell depletion is less specific but a helpful diagnostic feature.[5]

In long standing cases restoration of architecture may result in a normal mucosa.[6] There was normal crypt architecture in 1 case. The inflammatory infiltrate was composed of lymphocytes, plasma cells, neutrophils and eosinophils. Plasma cells are predominantly observed in between the crypts and muscularis mucosae (basal plasmacytosis) which is the earliest diagnostic feature with the highest predictive value for the diagnosis of UC.[6]

In our study also, basal plasmacytosis was a constant feature (present in 26cases). Cryptitis as defined by presence of neutrophils within crypt epithelium and crypt abscesses defined by the presence of neutrophils within crypt lumina are features suggestive of active inlammation.[6,7,8] We observed goblet cell depletion in 20 cases. Crohn's disease was characterized by the presence of small, multiple granulomas, foreign body type giant cells and lymphocytic infiltrate in the mucosa and submucosa. Crohn's disease cases also show focal active colitis pattern with aphthus ulcer formation and pyloric gland metaplasia.

Out of 9 cases of solitary rectal ulcer syndrome 6 cases were above 60 years of age while 3 cases were in 45-59 years of age group.

Tuberculous inflammation was found in 8 cases.

All 5 cases of amoebic colitis were clinically suspected of inflammatory bowel disease but turned out to be PAS stain positive trophozoites of E. histolytica in slough (amoebic colitis).

Out of 7 adenomatous polyp cases, 5 were tubular adenoma and 2 were villous adenoma with high grade dysplasia.

All malignant neoplastic lesions were of adenocarcinoma, among them 7 were of well differentiated adenocarcinoma (36.8%), 9 were of moderately differentiated adenocarcinoma (47.3%) and 3 were of poorly differentiated adenocarcinoma (15.7%).

IV. Discussion

The spectrum of colonic lesions span from infectious, idiopathic, inflammatory disease, polyps, motility disorders and colorectal tumours. All these lesions often require colonoscopic biopsies for their conclusive diagnosis.[9]

In the present study, 213 colonoscopic biopsies were received. Age range of the patient was from 2 years to 90 years, these findings were similar to findings of Shefali *et al*[10] where age range was from 3 years to 87 years. Most of them were male and male to female ratio is of 1.4:1, these findings were similar to findings of Shefali *et al*[10] , Albasri *et a*l[11] and Sudarshan *et al*[12] where male to female ratio of 1.8:1 and 1.7:1 and 1.3: 1 respectively.

Table 6 : Comparison of gender distribution of lesions

Study	No. of cases	No. of male patients
Sudarshan *et al*[12]	233	134(57.5%)
Shefali *et al*[10]	159	41(61.8%)
Present study	213	125(58.6%)

In the present study, clustering of cases were seen between 41 to 60 years of age group, with maximum cases seen in (41-50) 20.6% and (51-60) 19.7%. This finding corresponds with study series of Hassan Abdulla Al-aquii[13] which showed clustering of cases between 21-60 years.

Tuberculosis of gastrointestinal tract occurs as primary lesion or secondary to pulmonary tuberculosis. In the present study, eight cases (4%) were diagnosed as tuberculous inflammation. Studies done by Shefali *et al*.[10], Rangaswamy *et al*.[4] and Rajbhandari *et al*.[9] showed similar findings of three (4.4%), six (7.32%) and 14 (11.1%) cases of tuberculosis in colonoscopic biopsies.

The present study showed that 120 cases of chronic non-specific colitis(56%) and was the most common diagnosis. This findings were similar to Shefali *et al*[10], Rangaswamy *et al*.[4], Rajbhandari *et al*.[9] and Bashir *et al*.[14] where chronic non-specific colitis was the most common diagnosis comprising 47.1%, 45.21%, 27% and 38.3% respectively.[10,4,9,14]

Out of 213 biopsies, 88% biopsies were non neoplastic, 12% were neoplastic lesions. These findings were similar with the other studies of R.Teague *et al*[15], Sidney J *et al*[16] and Rajbhandari M *et al*[9] where non neoplastic lesions detected more than the neoplastic lesions.

Table 7: Showing distribution of all lesions in comparison with other studies

Study	No. of cases	Non neoplastic lesions	Neoplastic lesions
RajbhandariM *et al*[9]	126	93(73.8%)	33(26%)
Sidney J. *et al*[16]	212	130(61.3%)	82(38%)
Present study	213	187(88%)	26(12%)

In the present study, there were totally 26(12%) Neoplastic cases, these finding were similar with the other study of Rajbhandari M *et al*[9]. Out of which 19 were adenocarcinoma and 7 were Adenomatous polyp. All malignant neoplastic lesions were of adenocarcinoma, among them 7 were of well differentiated adenocarcinoma(36.8%), 9 were of moderately differentiated adenocarcinoma(47.3%) and 3 were of poorly differentiated adenocarcinoma(15.7%).these findings are comparable with that of Shefali et al[10]. 2 Adenomatous polyps are present with high grade dysplasia. It is important to diagnose these adenomatous polyps, as they are at higher risk of developing carcinoma and patients have to be screened according to the guidelines.

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