ORIGINAL ARTICLE

CLINICO-COLONOSCOPIC AND HISTOMORPHOLOGICAL SPECTRUM OF COLONIC DISEASES IN AN ACADEMIC TERTIARY CARE CENTRE

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ABSTRACT: AIMS: Colonoscopic examination is important in the diagnosis and treatment of various suspected colonic diseases. The procedure is used to look for early signs of colorectal cancer. The aims of this study were to correlate colonoscopic findings with the histopathological diagnosis obtained and also to study histopathological features of colonoscopic biopsy specimens. **MATERIAL AND METHODS:** The study was a retrospective analysis of data between April 2012 and June 2013. 507 colonoscopies were performed during this period. Colonoscopic biopsies showed significant findings on histopathology in 107 patients and were included in the study. The more severe diagnosis was used for analysis when there was more than one colonoscopic finding. All the colonoscopic biopsy specimens were immediately fixed and then routinely processed and embedded. Serial sections were prepared and stained with Hematoxylin and Eosin. Special stains like PAS and Van Gieson stains were used wherever necessary. **RESULTS:** The clinically significant findings seen on colonoscopy included colorectal cancers, IBD, colonic tuberculosis, strictures, solitary rectal ulcers and polyps. Other relevant findings seen were GI bleed and extrinsic compressions from contiguous structures. Among 107 biopsies, 82 biopsies were non-neoplastic, 25 biopsies were neoplastic. Overall 17 malignant lesions were picked up on histopathology. No significant histopathological findings were detected in biopsies from clinically not relevant colonoscopies. **CONCLUSION:** Chronic diarrhea and bleeding per rectum were the most common presenting complaints. IBD and malignancy were detected in a significant number of the biopsies. Histopathological diagnosis correlated well with the colonoscopy diagnosis offered. Colonoscopic screening can detect early colonic neoplasms in asymptomatic patients.

KEYWORDS: colonoscopy, histopathology, colorectal cancer, adenocarcinoma, inflammatory bowel disease

INTRODUCTION: 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.[1] Colonoscopic examination is important in the diagnosis and treatment of various suspected colonic diseases. It is a diagnostic procedure of choice for patients with diarrhea lasting for several weeks to months or for any bloody diarrhoea.[2]The procedure is used to identify early signs of colorectal cancer.

The colon and rectum can be sites for infections, inflammatory bowel diseases (IBD), vascular disorders, motor and mechanical conditions and various neoplasms. Macroscopically normal colonic mucosa may look pathologically inflamed.Thus without biopsy, significant inflammatory bowel disease may go unrecognized or be mistaken for a functional disorder.[2]

The American Society for Gastrointestinal Endoscopy has developed guidelines for colonoscopy based on the indications as 'generally indicated' and 'generally not indicated'.[3] The

colonoscopic findings can subsequently be divided into clinically significant and clinically not significant based on the further therapeutic decisions and prognosis.

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 analysis. Colonoscopic mucosal biopsies have been shown to be most accurate indicator of the extent of involvement of the colon in inflammatory bowel disease.

The aims of this study were to correlate colonoscopic findings with the histopathological diagnosis obtained and also to study histopathological features of colonoscopic biopsy specimens.

MATERIALS AND METHODS: The study was a retrospective analysis of data from the Departments of Surgical Gastroenterology and Pathology between April 2012 and June 2013. Patient demographics, clinical details, colonoscopic findings and apparent pathology noted and the final histopathological diagnosis made were all recorded. Biopsies (n =107) which showed significant pathological findings were included in the study.

507 colonoscopies were performed at the department of Surgical Gastroenterology during this period. Biopsies were taken in cases with clinically relevant findings, which affected the therapeutic decisions and prognosis like colorectal cancers (CRC), polyps, inflammatory bowel diseases, strictures and proctitis or colitis secondary to radiation. Biopsies were also taken in some normal colonoscopies where irritable bowel syndrome (IBS) was suspected. The more severe diagnosis was used for analysis when there was more than one colonoscopic finding. These were sent to the department of pathology for histopathological examination.

All the colonoscopic biopsy specimens were immediately fixed in 10% formalin for 24 hours. It was then routinely processed and embedded with the mucosal surface uppermost. Five microns thick serial sections were prepared and stained with Hematoxylin and Eosin. Detailed study was performed under the light microscope. Adequacy of the biopsy was assessed and an attempt was made to correlate the histopathological diagnosis with colonoscopic diagnosis obtained. Special stains like Periodic acid-Schiff stain (PAS) and Van Gieson stains were used wherever necessary.

RESULTS: Biopsies taken from 107 cases showed significant findings on histopathology and these were included in the study. The clinically significant findings seen on colonoscopy included colorectal cancers, IBD, colonic tuberculosis, strictures, solitary rectal ulcers and polyps (Fig 1-8). Other relevant findings seen were GI bleed and extrinsic compressions from contiguous structures.

Ages ranged from 16-83 years, with a mean age of 47.48 ± 13.86 years. 68 biopsies were from men and 39 biopsies were from women. The male to female ratio was 1.74: 1. The presenting symptoms in the study population were chronic diarrhea, bleeding per rectum, abdominal pain, chronic constipation and weight loss, seen in 66.36%, 64.49%, 27.10%, 13.08% and 10.28% respectively. The duration of these symptoms ranged from 1 month to 2 years.

Among 107 biopsies, 82 biopsies were non-neoplastic, 25 biopsies were neoplastic. One case was classified as biopsy specimen inadequate or unsatisfactory for evaluation on initial biopsy; a repeat biopsy was requested and later was reported as chronic colitis. Overall 17 malignant lesions were detected on histopathology. The distributions of all the lesions are summarized in Tables 1, 2 and 3. (Fig 9-16)

Diagnosis	Number	Total	%
Non neoplastic		82	76.63
Neoplastic		25	23.37
- Benign	8		32.00
- Malignant	17		68.00
Total		**107**	**100.00**

Table 1: Classification of all Lesions

Diagnosis	No. of cases	%
Chroniccolitis	37	45.12
Ulcerativecolitis	18	21.95
Acute colitis	8	9.76
Tuberculosis	6	7.32
Inflammatory polyp	3	3.66
Solitary rectal ulcer	3	3.66
Crohn's colitis	2	2.44
Hyperplastic polyp	2	2.44
Amoebic colitis	1	1.22
Lymphoid polyp	1	1.22
Malabsorption syndrome	1	1.22
Total	**82**	**100.00**

Table 2: Distribution of Non Neoplastic Lesions

		Lesions	No		Total	%
Benign					**8**	**32.00**
	No Dysplasia	Serrated adenoma		1		12.50
	With Dysplasia			7		87.50
		Serrated adenoma	1			
		Villous adenoma	2			
		Tubulovillous adenoma	2			
		Tubular Adenoma	2			
Malignant					**17**	**68.00**
	Adenocarcinoma			16		94.12
		Well differentiated	6			
		Mod differentiated	7			
		Poorly differentiated	2			
		Mucin secreting	1			
	Melanoma			1		5.88
Total					**25**	**100.00**

Table 3: Distribution of Neoplastic Lesions

DISCUSSION: Colonic conditions like infections, inflammatory bowel diseases, polyps and colorectal cancers are important lesions which often require colonic biopsy for their conclusive diagnosis.[4] Lower GI endoscopic evaluation is established as the diagnostic procedure of choice in the setting of diarrhea and lower GI bleed.

Out of 107 biopsies, 76.64% biopsies were non neoplastic, 23.36% biopsies were neoplastic lesions. These finding are similar with the other studies where non neoplastic lesions were detected more than the neoplastic lesions (66.3% vs. 28.9%, 61.3% vs. 38.7%).[4, 5] In another study the neoplastic lesions were seen more than the non-neoplastic lesions (56.2% vs. 43.1%).[6] Out of 82 biopsies diagnosed as non-neoplastic lesions, 45.12% biopsies comprised of chronic colitis, 9.76% biopsies were acute colitis, 24.39% were IBD and others made up 20.73%. Similar findings were seen in other previous study series where colitis was seen in 47.3% and 38.3% biopsies.[4, 7] A lower rate of colitis at 14.9% was seen in one previous study.[8]

Colitis was diagnosed in 54.88% of the biopsies, 9.76% acute colitis, and 45.12% chronic colitis. Acute colitis was characterized by neutrophilic infiltrate in the lamina propria. No crypt abscess or decrease in goblet cells was observed. Chronic colitis was characterized by well-preserved architecture of mucosal glands, normal goblet cells, and predominant lymphoblastic infiltrate in the lamina propria. Some biopsies also showed lymphoid follicles in the lamina propria. 7.32% showed tuberculosis and were characterized by presence of confluent granulomas with areas of caseation necrosis, aggregation of epithelioid cells, Langhans giant cells and lymphocytic infiltrate. 1.22% of biopsies each were diagnosed as amoebic colitis and malabsorption syndrome. Amoebic colitis was characterized by ulcerated mucosa and the exudates contained inflammatory cells along

with amebic trophozoites some of which showed erythrophagocytosis. Malabsorption syndrome is characterized by villous atrophy of terminal ileum.

Six resected specimens of polyps were analyzed. Of these, 50% were inflammatory polyps, 33.33% were diagnosed as hyperplastic polyps and 16.67% lymphoid polyp. Inflammatory polyps were characterized by finger-like projections of submucosa covered by mucosa on all sides suggesting healing. The hyperplastic polyps were characterized by elongation of crypts in association with tall columnar cells giving the epithelium a crowded, tufted or crenated appearance. Goblet cells were relatively sparse. Lymphoid polyps were characterized by aggregates of mucosa associated lymphoid tissue with germinal centers.

18.69% of all biopsies were diagnosed as inflammatory bowel diseases. Previous studies also show a similar detection rate of IBD with 28.2% and 39% while one other study showed lesser incidence of IBD (14.9%).[4, 7, 8] Ulcerative colitis (UC) was predominantly seen in 90% of biopsies while Crohn's disease (CD) was significantly less seen at 10%. Three phases were described in UC, active phase;resolving phase and remission phase.[9] Majority of the cases of UC in our study were in active phase (88.89%) while remaining 11.11% were in resolving or remission phases. Active phase of UC showed epithelial necrosis, distortion of glandular pattern, and increase in the number of neutrophils, lymphocytes and plasma cells in the lamina propria, crypt abscesses, and decrease in the number of goblet cells with the bases of the crypts showing epithelial hyperplasia. Resolving phase was characterized by distorted and branched crypts with a villous surface, regenerative hyperplasia of the base of crypts, restoration of goblet cell population, reduction in the inflammatory cell infiltrate with few polymorphs and/or crypt abscess. In the remission phase, epithelial surface was flat, crypt atrophied and distorted, goblet cell population was normal. The lamina propria showed mild lymphoplasmacytic infiltrate. CD was characterized by the presence of small, multiple granulomas, foreign body type giant cells and lymphocytic infiltrate in the mucosa and submucosa.

Tuberculosis was seen in 7.32% of the non-neoplastic diseases, characterized by confluent granulomas, aggregation of epithelioid cells, langhans giant cells and caseation necrosis in the mucosa. Other previous studies have shown a higher percentage at 75% and 41%.[10, 11]

23.36% biopsies were classified as neoplastic lesions, of which 32% were benign, and 68% biopsies were malignant. Equal number of adenomas-serrated, villous, tubular and tubulovillous adenomas were seen. Serrated adenomas have dilatation of the crypt most pronounced at the base, presence of horizontally oriented crypts, large areas without endocrine cells with nuclear atypia. Tubular adenomas were characterized by closely packed epithelial tubules with little papillary infoldings. Both goblet cells and tall columnar cells were seen. Villous adenomas are characterized by finger like or leaf like villous process of lamina propria covered by dysplastic epithelium. Tubulovillous adenomas were characterized by features of both tubular and villous adenoma. We have seen a higher rate of dysplasia at 87.5% in our study compared to 20.6% in a previous study.[12]

Malignancies were seen in 15.89%. 94.11% were adenocarcinomas and 5.89% were melanoma. Out of these adenocarcinomas, 35.30% were well differentiated, 41.18% were moderately differentiated, 11.76% were poorly differentiated and 5.88% was mucin secreting type. Well differentiated adenocarcinomas are characterized by malignant glands infiltrating submucosa. The tumor cells are arranged in glandular pattern with some showing papillary process and were lined by tall columnar cells with hyperchromatic nuclei and showed mild nuclear stratification. Moderately differentiated adenocarcinomas show malignant glands with irregular outline. There is

loss of nuclear polarity and variation in nuclear size and shape. Poorly differentiated adenocarcinomas display highly irregular and ill formed tubular structures. The tumor cells are seen in groups and cords and showed pleomorphism, hyperchromatic nuclei with prominent nucleoli and scanty cytoplasm. Mucin secreting adenocarcinomas with the tumor cells showing abundant clear cytoplasm with eccentric hyperchromatic nuclei. This case was PAS positive indicating presence of intracellular and extracellular mucin. These findings were, in other previous studies at 47%, 16.5%, and 52.0% vs. 45.5%, 70.1%, 14.9% vs. 7.5%, 13.4%, 14.9%, respectively.[9, 13-15]We can see a similar finding as in our study in the moderately and poorly differentiated adenocarcinomas with these studies.

CONCLUSION: Chronic diarrhea and bleeding per rectum were the most common presenting complaints. IBD and malignancy were detected in a significant number of the biopsies. Histopathological diagnosis correlated well with the colonoscopy diagnosis offered. Colonoscopic screening can detect early colonic neoplasms in asymptomatic adults. Greater awareness of the disease and understanding of pathogenesis on the part of the pathologist is necessary for a better improved diagnosis since the specimens are smaller in size.

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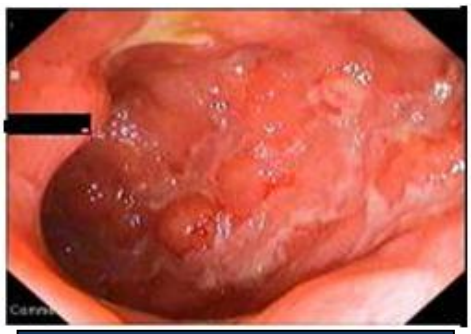

Fig. 1: Colonoscopic appearance Of Crohn's Disease

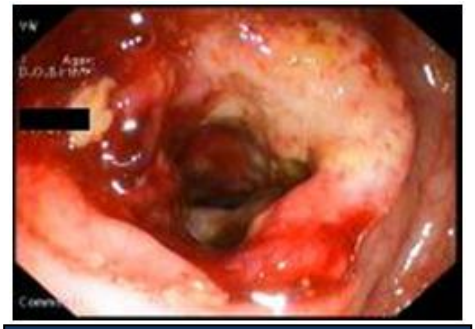

Fig. 2: Colonoscopic appearance Of Carcinoma of Transverse colon

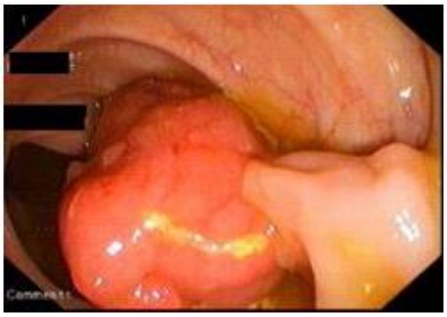

Fig. 3: Polyp on colonoscopy

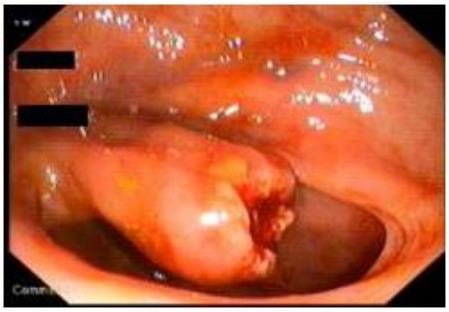

Fig. 4: Polyp Snared

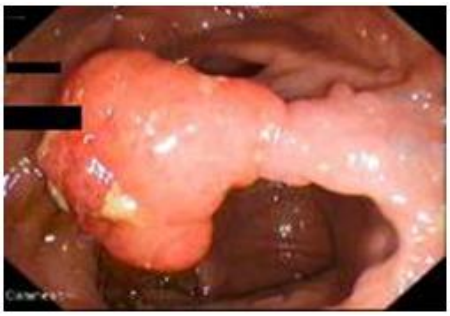

Fig. 5: Colonoscopic appearance Of adenomatous polyp

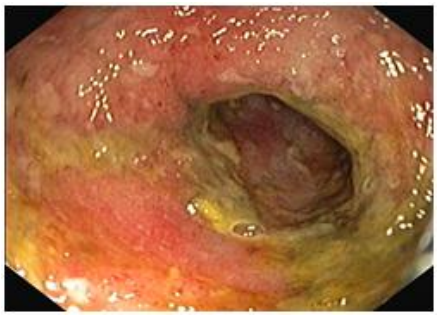

Fig. 6: Colonoscopic appearance of ulcerative colitis

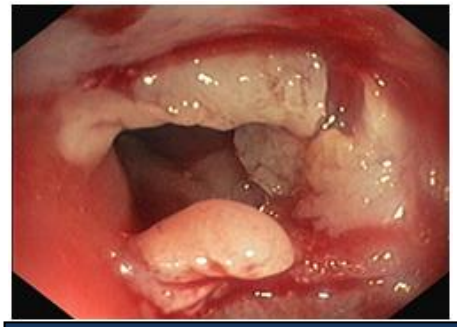

Fig. 7: Colonoscopic appearance of stricture secondary to tuberculosis

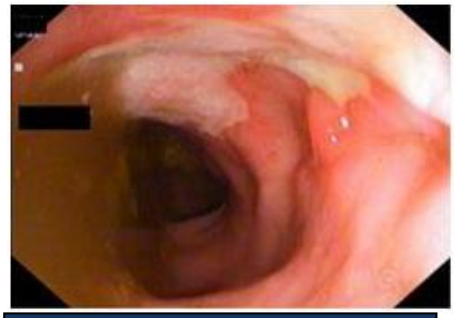

Fig. 8: Colonoscopic appearance Of Solitary rectal ulcer (SRUS)

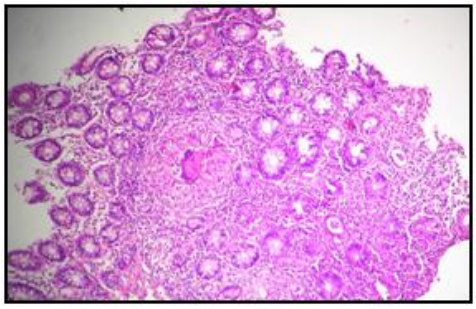

Fig. 9: Crohn's disease showing granuloma, cryptitis and crypt abscess (HPE, H&E x100)

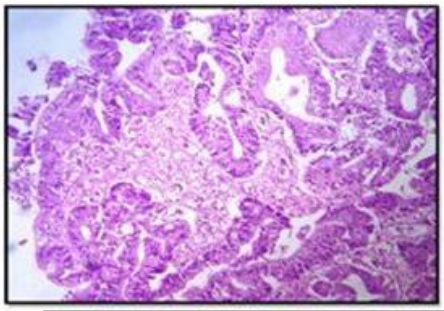

Fig. 10: Well differentiated adenocarcinoma colon (HPE, H&E x40)

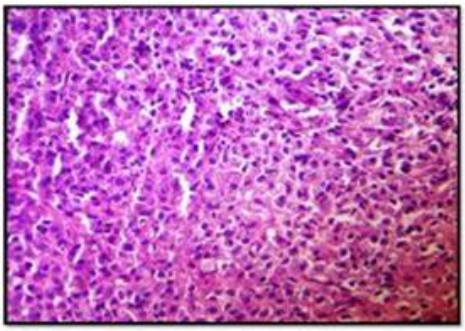

Fig. 11: Poorly differentiated adenocarcinoma colon (HPE, H&E x100)

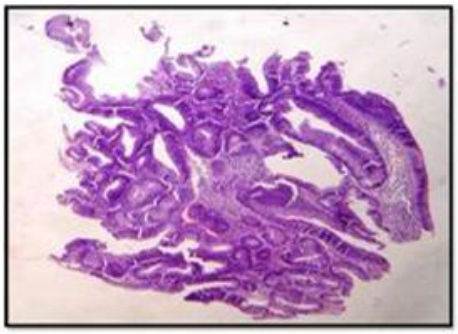

Fig. 12: Tubulo-villous adenoma (HPE, H&E x 100)

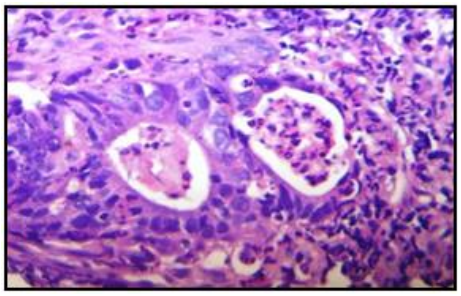

Fig. 13: Ulcerative Colitis with Dysplasia Showing cryptitis, crypt abscess and dysplastic cells (HPE, H&E x400)

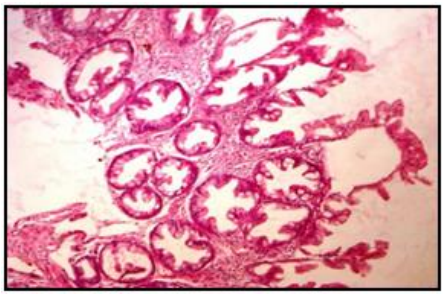

Fig. 14: Serrated adenoma. Showing serrated glands (HPE, H&E x400)

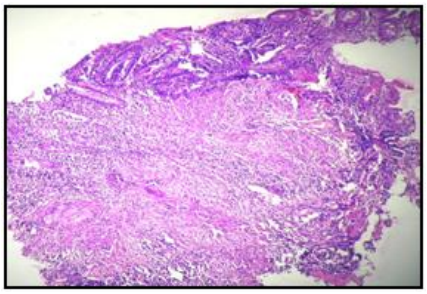

Fig. 15: Tuberculosis, granuloma (HPE, H & E x100)

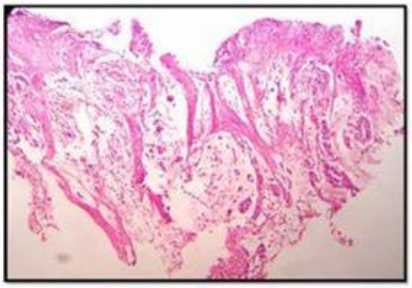

Fig. 16: Mucinous adenocarcinoma colon (HPE, H&E x 40)

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