Colonoscopy and Microscopy: Two sides of the coin- Our experience at Tertiary Care Centre in Central India

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Abstract

Introduction: The colonoscopy along with mucosal biopsy interpretation forms a prime diagnostic tool in work of patients with lesional diversity of colorectal region. The study was conduted to evaluate the histomorphological spectrum of colorectal lesions on colonoscopic biopsies and correlate the microscopy (histomorphology) with colonoscopic diagnosis offered.

Materials and Methods: The material consisted of 168 colonoscopic biopsies which were submitted to the Department of Pathology, Govt. Medical College & Superspeciality Hospital, Nagpur during the period of Jan 2014 –Dec 2016. The histopathological classification of these lesions was based on WHO. Statistical analysis was done by Open Epi Info software.

Result: Out of 168 colonoscopicbiopsies, 116 were non-neoplastic and 52 were neoplastic. A higher frequency of colonic diseases occur in males with male: female ratio -1.4:1 and the age range was between 2yrs to 92 yrs. Among the non-neoplastic lesions, ulcerative colitis was most common diagnosis, with frequent age group involved was 41- 50 yrs. Uncommon but interesting lesions like amoebic colitis (2 cases), pseudo membranous colitis(1 case), Melanosis coli (1 case) & congestive colopathy (1 case) were also found. Hyper plastic polyp & retention polyps were most common in non-neoplastic category while villous adenoma with dysplasia's was most common in neoplastic polyps. Among the neoplastic lesions, conventional adenocarcinoma was the commonest subtype with rectum as the most common site.

Conclusion: Colonoscopy & Microscopy are the two sides of the coin which can be used effectively together not only in diagnosis &treatment of colorectal lesions but alsosurveillance of inflammatory bowel disease. As 48% of overall malignant lesions occurred in less than 50yrs of age, due importance should be given to colonoscopic screening to detect early colorectal neoplasm.

Keywords: Colonoscopy, Colorectal carcinoma, Dysplasia, Microscopy (histomrphology), Ulcerative colitis, Villous adenoma.

Introduction

India is a country with cultural diversity and so the variable dietary habits.[1, 2] Similar diversity is seen in spectrum of colorectal lesions ranging from infectious, inflammatory diseases, polyps and colorectal tumors.[1,3-4] With passing generations and changing lifestyle there is an increase in the incidence of gastrointestinal disease.[5] But with the advent of flexible endoscope, it is possible to view all portions of large intestine & rectum.[1,6-8] The colonoscopy with accompanying mucosal biopsy evaluation is the prime diagnostic tool in work up of patients with lesional diversity of colon & rectum.[9,10] So the study was undertaken with the following objectives to study histomorphological spectrum of colorectal lesions on colonoscopicbiopsies .and to correlate microscopy (histomorphology) with colonoscopic diagnosis offered. An attempt was also made to comment on severity and extent of colonic lesions wherever possible by histomorphological examination.

Material and Methods

This observational study was carried out in Department of Pathology, Govt. Medical College & Super Specialty Hospital, Nagpur from January 2014 to December 2016.Relevant clinical details and colonoscopic diagnosis were noted on requisition form. Patients of all the age groups and lesions of colon & rectum were included in the study. However inadequate biopsies and lesions of terminal ileum & anal canal were excluded from the study.

A minimum of 2-5 bits of tissues obtained during colonoscopic examination which were fixed immediately in 10% of formalin. Tissue was processed for routine histopathology and stained with Haematoxyline & Eosin stain. Special stains were used wherever required. Statistical analysis was done by Open Epi Info software.

Results

A total of 168 colonic biopsies were obtained over the span of three years. Our study had higher frequency of colorectal lesions in males with male to female ratio of 1.4: 1. Biopsies were performed on all the age groups, with the youngest being 2 years and oldest of 92 years. The biopsies were categories as non-neoplastic (116) and neoplastic lesions (52).

The lesional spectrum of non-neoplastic inflammatory cases is shown in Table (I). Ulcerative colitis (35.5%) was found as most common non-neoplastic lesion with the age group most commonly involved was 41-50 years followed by proctitis.

Table 1: Shows distribution of **Inflammatory Non-neoplastic Colorectal lesions**

Total	Acute Colitis	Chronic Colitis	Chronic Active Colitis	Granulomatous Colitis	Ulcerative Colitis	Proctitis	SRUS	Amoebic Colitis	Melanosis Coli	Congestive Colopathy	Pseudomembranous colitis
107	11	8	11	10	38	19	5	2	1	1	1

Total 20 colorectal polyps were studied among which neoplastic polyps were more common than the non-neoplastic one. Among non-neoplastic polyps (n=9) we had inflammatory polyp (n=1), hamartomatous polyp (n=2), retention & hyperplastic polyp 3 cases each .Distribution of neoplastic polyps is shown in table 2.

Table 2: Shows distribution shows distribution of Neoplastic polyps

Neoplastic polyp	Without dysplasia	With dysplasia
Tubular Adenoma	1(5%)	-
Tubulovillous Adenoma	1(5%)	4(20%)
Villous Adenoma	-	5(25%)
Total(11)	2	9

We had total of 41 malignant cases detected on histopathology with male to female ratio among the cancer group was 1.1:1. The distribution of malignant lesions is summarized in Table 3

Table 3: Distribution of malignant lesions

Age group	Adenocarcinoma	Mucinous Carcinoma	Signet ring carcinoma	Neuroendocrine Carcinoma
	M F	M F	M F	M F
0-10	- -			
11-20	- -	1		
21-30	- 1	1	1	
31-40	3 1			
41-50	6 3	11		1
51-60	2 3			
61-70	6 7			
71-80	2 1			
81-90	- -			
	19 16	2 2	1	1
Total (41)	35 (85.5%)	4(9.75%)	1(2.4%)	1(2.4%)

The most common age group affected by was 61- 70 yrs. The patients were broadly classified into younger (<50yrs) and older (>/= 50yrs) age group. In our study 48 %patients were <50yrs.

In our study rectum was most common site for malignant lesions 63.41 % followed by right sided colon 31.7% and left sided colon 4.8%.

The statistical analysis was done by Open EpiInfo software for comparing the diagnosis offered by colonoscopy with microscopy

(histomorphology) as a gold standard .Result: (95%CI)

1. Sensitivity - 75.95% (68.72-81.95%)
2. Specificity - 10% (1.79-40.42%)
3. Positive predictive value - 93.02 % (87.27-96.29%)
4. Diagnostic Accuracy - 72.02% (64.8-78.26%)
5. McNemar's Chi-Square (df =1) p = 0.0001

Discussion

Lesional spectrum of colorectal lesions can be very well visualized with flexible (fibro-optic) endoscope which is a establish diagnostic procedure of choice in the clinical settings of chronic diarrhea, constipation, abdominal pain & bleeding P/R.[1] But with the nonspecific symptomatology & colonoscopy mimics, colonic biopsy & thereby histomorphology is required for accurate & confirmative diagnosis.[1,9,10]

We studied total 168 colonoscopic biopsies during three years span, of which non-neoplastic were 69% and neoplastic 31%. Our findings correlated well with Pandey et al, Rangaswamy et al & Rajbhandari et al.[1,9,11]

Among non-neoplastic lesions, ulcerative colitis (Fig. 1) (38 cases) was the most common diagnosis in our study (Fig. 1). However Pandey et al, Rangaswamy et al & Rajbhandari al.[1,9,11] showed chronic colitis as the most frequent diagnosis. But according to Puri et al, Ray et al & Azad et al,[12-14] incidence & prevalence of ulcerative colitis is on rise in Indian subcontinent with shifting of non-neoplastic colorectal lesions from infectious to non-infectious life style diseases in last 40 years[12-14] justifying our findings.
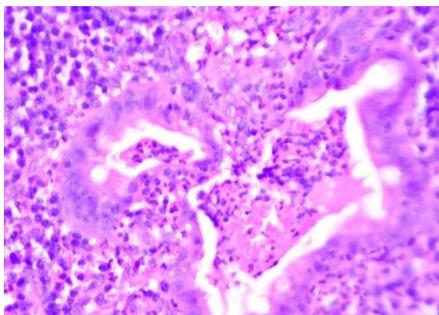

Fig. 1: Section showing -Intraepithelial neutrophils, crypt abscess & crypt deformity in Ulcerative colitis (H & E, x 200)

Disease prevalence of ulcerative colitis in our was highest in 41 -50 years of age[1,15,16] with pancolitis the most common colonoscopic diagnosis which mirrors the finding of other authors.[17]

Colonoscopy with accompanying biopsy has a crucial role in surveillance of ulcerative colitis[15,18] to reduce the risk of colorectal cancer. We had reported dysplasia in three cases of ulcerative colitis in follow up biopsies. (Fig. 2)
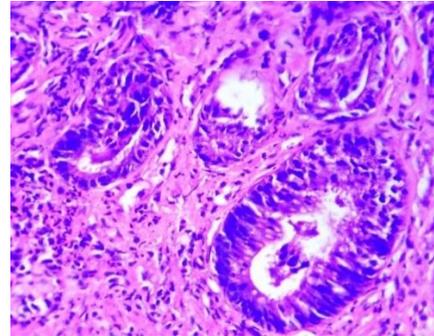

Fig. 2: Section showing dysplasia in Ulcerative colitis (H & E, x 200)

Tuberculosis is considered as a biggest health crisis confronting India[1,11,19]. Present study encountered with three cases of colonic tuberculosis (Fig. 3) showing multiple, confluent, well-formed granulomas typically congregated in lamina propria & sub mucosa with focal areas of necrosis in contrast to cryptcentric, ill formed granulomas of Chron's disease.[20]

Among the neoplastic polyps we had villous adenoma &tubulovillous adenomas with dysplasia's were most common mirrors the result of Rangaswamy et al[9] & contradicting with Konishi et al.[21] Higher grade dysplasia's reveal nuclear palisadation, occupying more cell length with less mucin production. Variable hyperchromasia with loss of polarity also noted.[20] Some authors[22,2] suggest if biopsy is taken from grossly evident mass lesions ,finding any degree of dysplasia deserves consideration for colectomy since such lesions more often have carcinoma.

Total 41 cases of colonoscopic biopsies were diagnosed as malignant of which 37 were conventional adenocarcinoma, mucinous adenocarcinoma (n=4) (Fig. 3), signet ring carcinoma (n=2) (Fig. 4) and a well differentiated neuroendocrine carcinoma (n=1) findings analogous to [1,9,11] Rectum was most common site for malignant lesion in our study matching with others.[1,3,9,11]
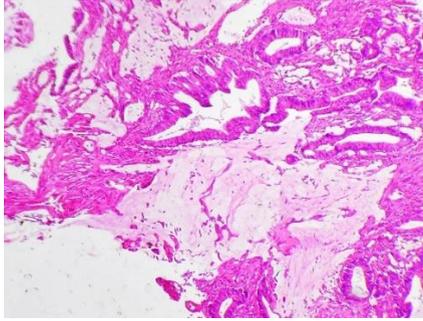
Fig. 3: Section showing Mucinous adenoncarcinoma (H & E, x 200)
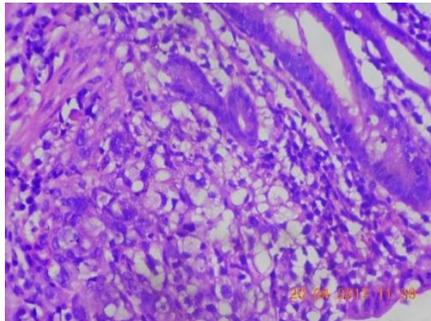

Fig. 4: Section showing Signet ring carcinoma, colon (H & E, x 200)

Regular endoscopic examination in the first year after surgery is important for detection of potentially curable recurrence.[24] We had three cases of recurrence of primary tumor at anastomotic site which represents failure cases.

One patient of carcinoma cervix in our study who received pelvic irradiation, developed rectal adenocarcinoma ten years after the radiation exposure, a known complication.[25]

48% of overall malignant lesions occurred in <50 years of age increasing our worry along with[1,11] insisting on starting the screening of colorectal malignancies at early age along with life style modification.

Conclusion

Colonoscopy & microscopy are the two sides of the coin which can be used effectively together not only in diagnosis & treatment of colorectal lesions but also in surveillance of inflammatory bowel disease & screening of colorectal cancer as the positive predictive value was found to be 93%.

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