

Colonic endoscopy in detecting lower GI lesions and its histologic correlation

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Abstract

Aims and Objectives: The aim of this study was to see the efficacy of endoscopic colonoscopy in detecting lower GI lesions and differentiation on the basis of color and surface pattern findings on colonoscopy with histopathologic correlation.

Materials and Methods: 94 patients with the lower GI symptoms were subjected for lower GI endoscopy by Olympus Evis Exera III CLV-190 HD colonoscope for suspected neoplastic and inflammatory lesions. Biopsies were taken from all suspected lesions stained with Haematoxylin and Eosin as well as Periodic Acid Schiff-Diastase stain. Statistical analysis was done to compare the endoscopic diagnosis with the histopathological diagnosis.

Results: 70 (74%) were males and 24 (26%) were females, with male to female ratio of 2.9: 1. Majority of the patients were in the third decade of life. CECT whole abdomen showed positive findings of colorectal malignancy in 14 (56.0%) of the total 25 cases. Conventional endoscopic was suggestive of inflammatory colorectal lesion in 59 (62.8%) and neoplastic polypoidal lesion in 35 (36.2%) patients. On histopathological examination, 9 patients were diagnosed with non-neoplastic lesions; of which 6 (66.7%) cases were diagnosed as hyperplastic polyps, 2 (22.2%) as juvenile polyps and 1(11.4%) case as inflammatory polyp. Biopsy of 59 cases of UC showed 39 patients to be mild UC and 20 cases as quiescent UC. The sensitivity and specificity of conventional endoscopic in differentiating between neoplastic and non-neoplastic colorectal lesion was 87.7% and 71.8% respectively and 91.0% and 55.0% respectively in determining the grade of inflammation in ulcerative colitis.

Conclusions: Colonic endoscopy is a valuable tool in the diagnosis of bowel diseases, especially bleeding lesions and crohn's disease with high sensitivity and specificity in differentiating between neoplastic and non-neoplastic colorectal lesions.

Keywords: Endoscopy, GI lesions, Histopathology.

Introduction

Colorectal cancer (CRC) is the commonest among the GI tract malignancies. According to GLOBOCAN 2012 estimates, there were 13,60,602 new cases of CRC worldwide and 447,136 new cases of CRC in Europe.⁽¹⁾ More than 95% of CRC arise from either pre-existing adenomas or due to dysplastic changes in the chronic inflammatory bowel disease.⁽²⁾ Surgery only provides the definitive treatment of most of the cancers and is curative if detected in early stage.

Crux of success depends upon the early detection of these premalignant colorectal lesions. Lower GI endoscopy is the only tool for early detection of these premalignant conditions. Peutz-Jegher's syndrome is a potential risk factor for gastrointestinal as well as extra intestinal malignancies.⁽³⁾ Screening regimen for Peutz-Jegher's syndrome consist of colonoscopy, upper GI endoscopy beginning at age 20 years and repeated at 2 year intervals.⁽³⁾

According to the literature, the conventional white light colonoscopy may miss the small lesions upto size of 5 mm in 26% of the patients, whereas the sensitivity of other imaging technique may vary depending upon type of imaging such as CECT, MRI, PET scan and virtual colonoscopy.⁽³⁾ Endoscopy has the advantage of providing the therapeutic interventions at the same time if the lesion is suspected

of premalignant condition where-as the non-neoplastic lesions may be left in-situ and managed accordingly.⁽⁴⁾ White light endoscopy has limitation in differentiating between benign and malignant lesions.

Several endoscopic imaging techniques have been developed in the past decade which may facilitate endoscopist to improve the detection of flat and small lesions as well as to enable real-time differentiation between neoplastic and non-neoplastic lesions. In addition, these new imaging techniques may also be able to differentiate neoplastic from non-neoplastic polyps, thereby enabling the endoscopist to leave non-neoplastic lesions in situ and making colonoscopy more efficient.⁽⁵⁾

The aim of this study was to see the efficacy of endoscopic colonoscopy in detecting lower GI lesions and differentiation on the basis of color and surface pattern findings on colonoscopy with histopathologic correlation.

Materials and Methods

This prospective study was conducted in the Departments of Surgery and Pathology at Jawaharlal Nehru Medical College, Aligarh Muslim University, Aligarh, after taking the informed consent from the patients. All patients included in the study underwent a thorough clinical workup (including detailed history, clinical examination and digital rectal examination.

The patients with the lower GI symptoms were subjected for lower GI endoscopy by Olympus Evis Exera III CLV-190 HD colonoscope. Each suspected neoplastic lesions such as polyps or flat lesion was washed free of stool and mucus, and examined by conventional white light endoscopy. Biopsies were taken from all suspected lesions by punch tissue biopsy forceps, fixed in 10% formalin, paraffin embedded and cut into 3-5 μ thick sections and stained with Haematoxylin and Eosin as well as Periodic Acid Schiff-Diastase stain, when indicated. Finally, statistical analysis was done to compare the endoscopic diagnosis with the histopathological diagnosis.

Observations

Among the 94 patients, 70 (74%) were males and 24 (26%) were females, with male to female ratio of 2.9: 1. Our study population ranged from 11-70 years, with a mean age of 36.22 ± 16.9 years. Majority of the patients were in the third decade of life.

Diarrhea was the commonest clinical presentation, present in 60 (63.8%) patients, followed by bleeding per rectum in 58 (61.7%), mucus with stool in 53 (56.4%), pain abdomen in 48 (51%) respectively.

Ultrasonography was performed on 30 patients and was reported normal in all of them. Stool for occult blood (SFOB) was done in 50 cases suspected of neoplastic colorectal lesions and was positive in 31 (62.0%) cases. CECT whole abdomen was done in 25 suspected cases of colorectal malignancy and had positive findings in 14 (56.0%) of them.

Conventional endoscopic was done in all the 94 patients. In 59 (62.8%) patients, the conventional endoscopy was suggestive of inflammatory colorectal lesion (Non-specific colitis, IBD), which was also the commonest finding. 35 (36.2%) patients were diagnosed as neoplastic polypoidal lesion on conventional endoscopy.

On histopathological examination, 9 patients were diagnosed with non-neoplastic lesions. Of these 9 non neoplastic lesions, there were 6 (66.7%) hyperplastic polyps. There were 2 (22.2%) cases of juvenile polyps while 1(11.4%) case of inflammatory polyp was present among the HPE diagnosed non neoplastic polypoidal lesions (Table 1). Most common malignant neoplasm of the colorectal region was well differentiated adenocarcinoma, seen in 7 (31.8%) cases (Table 2). On histopathological examination of 59 cases of UC, 39 patients were diagnosed as mild UC and 20 cases were diagnosed as quiescent UC.

Table 1: Non-neoplastic polypoidal colorectal lesion on histopathology

Non-neoplastic lesion	No. of cases	Percentage
Inflammatory Polyps	1	11.4
Hyperplastic Polyps	6	66.7
Juvenile Polyps	2	22.2
Total	9	100

Table 2: Neoplastic colorectal lesion on histopathological examination

Neoplastic lesions	No. of cases	Percentage
Well differentiated	7	31.8
Moderately differentiated adenocarcinoma	3	13.6
Mucinous adenocarcinoma	2	9.0
Squamous Cell Carcinoma	4	18.2
IBD with malignant changes	1	4.5
Tubular adenoma	3	13.6
Tubulo-villous adenoma	2	9.0
Total	22	100

The sensitivity and specificity of conventional endoscopic in differentiating between neoplastic and non-neoplastic colorectal lesion was 87.7% and 71.8% respectively. Positive predictive value and Negative predictive value was 81.7% and 71.8% respectively. Out of 59 cases of inflammatory colorectal lesion/ Ulcerative Colitis, biopsy was suggestive of mild form of Ulcerative Colitis with superadded inflammation in 39 cases, quiescent Ulcerative Colitis without inflammation in 15 cases and resolving ulcerative colitis with marked fibrosis in 5 cases. Sensitivity and specificity of conventional endoscopic in determining the grade of inflammation in Ulcerative Colitis was 91.0% and 55.0% respectively.



Fig. 1: Mild ulcerative colitis on high resolution white light endoscopy

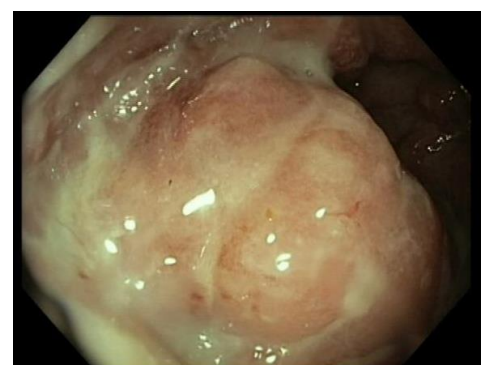


Fig. 2: Adenocarcinoma during high resolution white light endoscopy

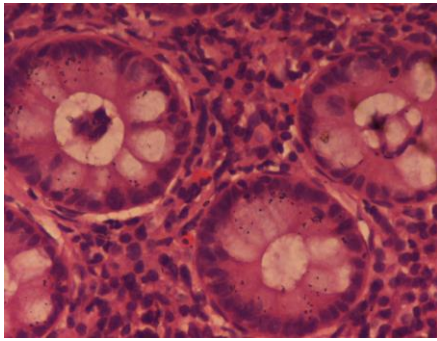


Fig. 3: Ulcerative Colitis (Mild form):
Photomicrograph shows crypt abscesses.
Haematoxylin and Eosin x 40X

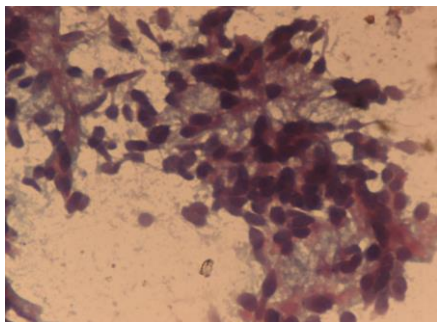


Fig. 4: Adenocarcinoma: Imprint smear shows
dyscohesive clusters of atypical columnar cells with
gland formation. Haematoxylin and Eosin x 40X

Discussion

In the present study, the incidence of colorectal lesions was more in males as compared to females, with sex ratio of 2.9:1. Studies by East et al also reported male dominance with sex ratio of 2.2:1.⁽⁶⁾

The mean age of presentation in our study was in 4th decade of life, which was discordant with the studies in developed nations by East and Sakamoto et al.^{7,8} Diarrhea was the most common clinical presentation followed by bleeding per rectum. Our findings were consistent with the study by Farmer et al, who also reported diarrhea as the common presenting feature.⁽⁹⁾

In present study, SFOB was most common non-invasive investigation used in 50 cases (53.1%) because of its easy availability, affordability and reasonable sensitivity and specificity for detection of adenoma and colorectal carcinoma. Guittet et al concluded that screening with the guaiac based fecal occult stool testing (FOBT) have reduced incidence by 20% and mortality of colorectal cancer by 16%. and it was positive in 62% of cases in one study.⁽¹⁰⁾ Quintero et al compared the sensitivity of colonoscopy with immunological FOBT and concluded that the sensitivity of fecal immunological testing is compatible to the colonoscopy for detection of colorectal cancer, but sensitivity is low for detection of advanced and non-advanced colorectal adenoma.⁽¹¹⁾

CECT abdomen was positive in 56% cases in our study. Our findings were concordant with Guittet et al, who also performed the similar test to diagnose the colorectal lesion.⁽¹⁰⁾ Pickhardt et al concluded that the

sensitivity of CT colonography for polyps more than 5 mm exceeds 90%.⁽¹²⁾

In our study, on conventional endoscopic examination, we found the most common colorectal abnormality as non-specific colitis/IBD in 59 (63.8%) cases and neoplastic lesion in 35 (36.2%) cases. Dysplastic changes in IBD is most reliable biomarker of IBD, being present in 70% of CAC.⁽¹³⁾ Majority of malignant neoplasms of colorectal region are adenocarcinoma and its histologic variant account for 90-95% of all colorectal malignancies.⁽¹⁴⁾

Our study showed the sensitivity and specificity of conventional endoscopic in differentiating between neoplastic and non-neoplastic colorectal lesion to be 87.7% and 71.8% respectively. Quite similarly, Su et al have stated that for differential diagnosis of neoplastic (adenoma and adenocarcinoma) and non-neoplastic (hyperplastic) polyps, the sensitivity of the conventional colonoscope for detecting neoplastic polyps was 82.9%, specificity was 80.0% and diagnostic accuracy was 81.8%.⁽¹⁵⁾

Conclusions

Colonic endoscopy is a valuable tool in the diagnosis of bowel diseases, especially bleeding lesions and crohn's disease with high sensitivity and specificity in differentiating between neoplastic and non-neoplastic colorectal lesions.

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