Histopathological Spectrum of Lower GI Tract Endoscopic Biopsies

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Abstract

Background: Colonoscopy provides information on the natural history and complications of many lesions. Biopsy forceps provide the opportunity to obtain multiple samples for evaluating the pathogenesis of the disease. Pathologist plays an important role in the diagnosis and management of patients with colitis. It is further made use of for GI cancers that are amongst the commonest malignancies worldwide.

Subjects and Methods: This prospective study of 100 cases included colonoscopic biopsies received in the department of pathology, at Maharshi Markandeshwar Institute of Medical Sciences and Research.

Inclusion Criteria:1) Patients presenting with ulcers/abnormal growths 2) Lesions present at ileocecal junction and that up to rectum.

Exclusion Criteria: 1) Patients presenting with lesions above the ileocecal junction. 2)Inadequate biopsy in terms of only fibro collagenous tissue. 3)All biopsies below the rectum.

Results: In the study, out of 100 cases, 79 were non-neoplastic, 4 cases were benign neoplastic and 17 were neoplastic. Out of the non-neoplastic cases, maximum was ulcerative colitis (UC); followed by acute colitis and chronic colitis. The benign neoplastic lesions included tubular adenoma and tubule-villous adenoma. Amongst the malignant neoplastic cases, maximum cases were moderately differentiated adenocarcinomas. On endoscopic correlation, benign lesions, benign neoplastic and neoplastic lesions around 60%, 100% and 88% were correctly predicted respectively.

Conclusion: A comprehensive histopathological study of the colonoscopic biopsy specimens should be done in constant correlation with the clinical and colonoscopy features. Colonoscopy with biopsy may be used for follow up of inflammatory diseases like UC and CD etc. and would also help in the early recognition of carcinoma in others.

Keywords: Endoscopic biopsy, Ulcerative colitis, Crohn's Disease

Introduction

Endoscopy owes its primitive beginning to Bozzini who, in 1806, developed his endoscope, a light transmitter, using candlelight reflected down an endoscope to view various physiologic orifices, including the rectum. The flexible fibre sigmoidoscope was successfully used in 1963.[1]

Colonoscopic inspection after colostomy as suggested by

Deddish and only a few surgeons took up Fairweather in 1953. Blankenhorn described Trans intestinal intubation for diagnostic purposes in 1955. Since the beginning of the 1960s diverse endeavours have been made to uncover a manner of inspecting the total colon endoscopically.

Colonoscopy provides information on the natural history and complications of many lesions. Biopsy forceps provide the opportunity to obtain multiple samples for the study, but physical limitations of the forceps restrict the sample to 1mm superficial pieces of the tissue.

Aims and objectives

- To study histopathological spectrum of lesions of lower gastrointestinal tract in patients undergoing lower gastrointestinal endoscopic biopsy.

- To study the overall frequency, age and sex distribution of lower gastrointestinal tract lesions and to correlate them with endoscopic/clinical diagnosis.

Materials & methods

The present study included colonoscopic/endoscopic biopsies received in the institution's Department of Pathology. This prospective study included a minimum of 100 patients or biopsies over a time period of two years picked up randomly.

Inclusion Criteria:

❖ Patients presenting with ulcers, abnormal growths, precancerous conditions and tumours.

❖ Lesions present at ileocecal junction and that up to rectum.

Exclusion Criteria

❖ Patients presenting with lesions above the ileocecal junction.

❖ Inadequate biopsy in terms of only fibro collagenous tissue.

❖ All biopsies below the rectum.

Brief clinical data was noted from the case records, which included the age and sex of the patient, relevant habits, if any, presenting symptoms and colonoscopic findings and presumptive clinical diagnosis were made.

The colonoscopic biopsy specimens, so obtained were put in saline, placed on the filter paper with mucosal surface upwards and fixed in 10% formalin. All the bits were embedded together for ideal visualization. Then, sections of 4-6 microns thickness were stained routinely with Haematoxylin and Eosin. Other special stains and immunohistochemistry was done as and when required.

Observations and results

In the current study, out of 100 cases the maximum cases were non-neoplastic comprising of 79 cases, 4 cases were benign neoplastic and 17 were neoplastic. Out of these, the non-neoplastic/inflammatory cases, there were 52 males and 27 females. Number of male and female patients belonging to benign neoplastic category were 3 and 1 respectively and these amongst the neoplastic category were 9 and 8 respectively.
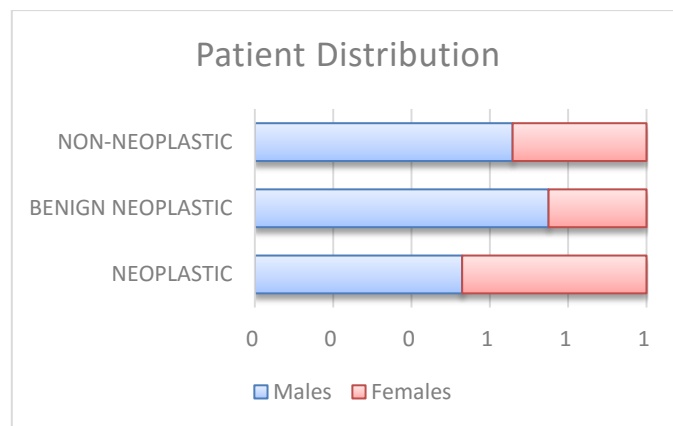

Figure 1: Most of the cases in the present study were non-neoplastic with 65% males, followed by neoplastic lesions with 52% males and lastly benign neoplastic lesions with 75% males.

Out of total 79 non-neoplastic lesions maximum 27 cases were of UC with a peak incidence in fifth decade and a clustering was also noted from third decade of life to fifth decade; second most common condition with 25 cases was reported to be acute colitis which had a peak incidence in

fifth decade and case clustering similar to ulcerative colitis was noted; third most common condition was chronic colitis with 14 cases which had maximum cases in the third decade, with a somewhat flat incidence curve around fourth to sixth decade of life. Among the rest of the cases 4 were tuberculous colitis; CD, Cytomegalovirus (CMV) colitis and pseudo-polyps comprised of 2 cases each and single case each of hyperplastic polyp, juvenile retention polyp and mucosal prolapse syndrome. (Table 1)

Our study resulted in a total of 4 cases of benign neoplastic lesions, including 2 cases each of tubular adenoma and tubulo-villous adenoma. One case each of tubular adenoma and tubulo-villous adenoma was diagnosed in fifth decade; rest single case of tubular adenoma in fourth decade and tubulo-villous adenoma in sixth decade. (Table 2)

We classified the malignant cases as per W.H.O. 2010 into well differentiated, moderately differentiated and poorly differentiated. Moderately differentiated adenocarcinomas showed malignant glands with irregular outline, there was loss of nuclear polarity and variation in nuclear size and shape.

Poorly differentiated adenocarcinomas were the ones that displayed highly irregular and ill formed tubular structures. The tumour cells were in groups and cords and showed pleomorphism, hyperchromatic nuclei with prominent nucleoli and scanty cytoplasm.

We would like to point it out here that biopsy specimens, when obtained by colonoscopy, consisting only of mucosa, makes it difficult to comment on the extent of the tumour and in these cases, the existence or absence of carcinoma in the deeper mucosal biopsy should be indicated & absence of submucosa should be noted.

Table 1. Non-neoplastic Lesions with Age Distribution

	0-10	11-20	21-30	31-40	41-50	51-60	61-70	71-80	Total
ACUTE COLITIS	0	0	5	5	10	3	1	1	25
CHRONIC COLITIS	0	0	5	2	2	3	2	0	14
UC	1	2	6	7	8	3	0	0	27
CD	0	0	0	2	0	0	0	0	2
TUBERCULOUS COLITIS	0	1	0	0	0	2	1	0	4
CMV COLITIS	0	1	0	1	0	0	0	0	2
PSEUDOPOLYP	0	0	1	0	1	0	0	0	2
HYPERPLASTIC POLYP	0	0	0	0	0	0	0	1	1
JUVENILE RETENTION POLYP	1	0	0	0	0	0	0	0	1
MUCOSAL PROLAPSE SYNDROME	0	0	1	0	0	0	0	0	1
TOTAL	2	4	18	17	21	11	4	2	79

Table 1: Out of the total 79 non-neoplastic lesions maximum cases were of UC followed by acute colitis and chronic colitis and mostly presented in 5th decade.

The present study had a total of 17 malignant neoplastic cases, which comprised of a maximum of 7 cases of moderately differentiated adenocarcinomas and 5 cases each of well and poorly differentiated adenocarcinomas. The malignant lesions were found to have a peak incidence in fifth decade of life with 5 cases and a second peak was shared equally by both third and seventh decade with 3 cases each. (Table 3)

Out of the 79 inflammatory/non-neoplastic cases, endoscopic correlation revealed that about only 71% of these cases only were endoscopically correctly predicted. Whereas, both the benign neoplastic lesions viz. tubular adenoma and tubulovillous adenoma were in concordance to their endoscopic findings. Similarly, when the histologic diagnoses of malignant were compared to the provisional endoscopic diagnoses, only about 88% of the cases corresponded to each other. (Figure 2)
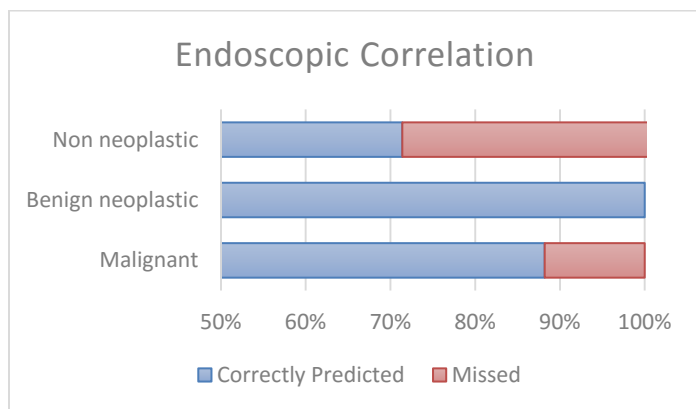

Figure 2: On endoscopic correlation of non-neoplastic, benign neoplastic and malignant cases 71.4%, 100% and 88.2% respectively were correctly predicted by endoscopy.

Discussion

Colonic conditions like infections, IBD, polyps and colorectal tumours are lesions, which often require colonic biopsy for their conclusive diagnosis.[2] Lower endoscopic evaluation is established as the diagnostic procedure of choice in the setting of diarrhoea and lower GI bleed.

In the present study, of the 79 cases diagnosed as non-neoplastic lesions, chronic colitis was found to be less prevalent than acute colitis. This outcome is contrary to studies performed by A.L.Flick et al [3] and R.J.Dickinson et al [4], where acute colitis was about same or slightly lesser than chronic colitis respectively. In our study, there were 27 patients (34.2% of inflammatory lesions) of ulcerative colitis. Dickinson et al [4] in their study of 74 cases included 11 (14.9%) cases of ulcerative colitis, whereas A.L. Flick et al [3] described 47(28.1%) cases in his study of 167 cases. Clustering of ulcerative colitis cases in the current study were noted between ages between 21 to 50 yrs with maximum number of cases between the age group of 41-50 yrs and a maximum number of these cases were males {16 (59.3%)}.

Table 2: Benign Neoplastic Lesions with Age Distribution

	11-20	21-30	31-40	41-50	51-60	61-70	Total
Tubular adenoma	0	0	1	1	0	0	2
Tubulovillous adenoma	0	0	0	1	1	0	2
TOTAL	0	0	1	2	1	0	4

Table 2: Amongst the benign neoplastic lesions, tubular adenoma and tubulovillous adenoma had an equal distribution with majority cases presenting in 5th decade.

Table 3. Malignant Neoplastic Lesions with Age Distribution

	21-30	31-40	41-50	51-60	61-70	71-80	81-90	Total
WELL DIFFERENTIATED ADENOCARCINOMA	2	2	0	1	0	0	0	5
MODERATELY DIFFERENTIATED ADENOCARCINOMA	1	0	2	1	2	0	1	7
POORLY DIFFERENTIATED ADENOCARCINOMA	0	0	3	0	1	1	0	5
TOTAL	3	2	5	2	3	1	1	17

Table 3: Most of the malignant cases in our study were moderately differentiated adenocarcinomas followed by equal number of well and poorly differentiated adenocarcinomas.

27 patients (34.2% of inflammatory lesions) of ulcerative colitis. Dickinson et al [4] in their study of 74 cases included 11 (14.9%) cases of ulcerative colitis, whereas A.L. Flick et al [3] described 47(28.1%) cases in his study of 167 cases. Clustering of ulcerative colitis cases in the current study were noted between ages between 21 to 50 yrs with maximum number of cases between the age group of 41-50 yrs and a maximum number of these cases were males {16 (59.3%)}. Morson however gave the peak incidence of ulcerative colitis in third decade of life he described this in a child of 3 weeks to patients over 50 years, with predilection for females over males with a ratio of 3:2. He further described the diseases into three phases as active phase, resolving phase and phase of remission respectively.[5]

In continuation with inflammatory disorders; there were 2% cases of Crohn's colitis in the present study where they were characterized by presence of small, multiple granulomas, foreign body type of giant cells and lymphocytic infiltrate in the mucosa and submucosa. Tandon HD et al [6] in their report on 121 patients, described 10 cases (8.2%) of Crohn's disease.

Our study included 4% cases of tuberculosis characterized by confluent granuloma, aggregation of epithelioid cells, Langhan giant cells and caseation necrosis in the mucosa. All of these cases later on stained positive for presence of tubercular bacilli by Ziehl Neelsen stain. Tandon et al [6] in their analysis of 212 patients, described 159 cases of TB. Bhargava et al[7] in a study of multiple biopsies from 14 proven cases of colonic TB, found that in 21% of the cases, they could diagnose tuberculosis on the basis of typical granulomas alone.

As far as malignant lesions are concerned, in this study, out of the 17 cases of malignancy, most of these cases (12 cases) presented with bleeding per annum associated with chronic diarrhoea as a major complaint followed by 7 cases presenting with chronic diarrhoea with pain abdomen and 3 cases had chronic diarrhoea associated with loss of appetite and weight; these comprised of a cumulative 17% cases. The average age at the time of diagnosis was 51 years and found to be marginally common in males (53%). The current study articulates that

adenocarcinoma is the commonest malignant tumour of the colon. These findings were in accordance with similar studies done by Ibrahim KO et al [8], Rickert et al [9], Williams et al [10], Imperiale TF et al [11].

Table 4. Comparative evaluation of cellular differentiation of malignant lesions				
Studies	Well differentiated	Moderately differentiated	Poorly differentiated	Total
Linares et al (2002)[13]	101(47%)	98(45.5%)	16(7.5%)	215
Jonasson et al (2001)[12]	198(16.5%)	845(70.1%)	162(13.4%)	1205
Ibrahim KO et al (2001)[8]	97(52%)	61(32.8%)	28(14.9%)	186
Present study	5(29.4%)	7(41.2%)	5(29.4%)	17

Table 4: The present study somewhat correlates with study performed by Jonasson et al while studies performed by Linares et al and Ibrahim KO et al have predominance of well differentiated adenocarcinomas.

As shown in table 4, in the present study when we subclassified the adenocarcinomas as per well, moderately and poorly differentiated lesions, of the 17 cases, 5(29.4%) were well differentiated, 7(41.2%) as moderately differentiated and 5(29.4%) as poorly differentiated. This finding corresponded to studies conducted by Jonasson L et al. [12] However, studies conducted by Lineres et al [13] concluded about equal number of well and moderately differentiated adenocarcinomas while the studies done by Ibrahim KO et al [8] constituted maximal cases of well differentiated adenocarcinomas followed by moderately differentiated adenocarcinomas and least number of cases of poorly differentiated adenocarcinomas.

Conclusion

Colonoscopy is a safe technique and has a high diagnostic vintage. The age distribution of patients in our study who underwent colonoscopic biopsy, ranged from a 3-year child to an 81-year-old man proving that it is a safe procedure.

Much difficulty was encountered in correct interpretation because of small size of the biopsy specimens received, and many a times because of the biopsy being not representative of the lesions. Histopathological diagnosis correlated well with the colonoscopic clinical diagnosis offered.

A comprehensive histopathological study of the colonoscopic biopsy specimens should be done in constant correlation with the clinical and colonoscopy features. Colonoscopy with biopsy is important in reaching a correct diagnosis and also may be used for follow up of inflammatory diseases like UC and CD, to define epithelial dysplasia in case of chronic colitis & that would help in the early recognition of carcinoma in such patients. Hence, colonoscopic biopsy has increased the role of pathologist in the analysis and treatment of diseases of large bowel, while scoring and maintaining a constant correlation with clinicians and correct interpretation still poses to be an exciting diagnostic challenge for most pathologists, because of occasional lack or representative biopsy and the small size of biopsy specimens.

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