MAK HILL Publications Research Journal of Medical Sciences

Research Article
doi: 10.59218/makrjms.2023.12.330.335

Studying the Clinical Profile of Colonic Lesions along with Evaluation of Pathological and Histopathological Findings

[1]Sambodhi C. Killarikar and [2]N.R. Patil
[1]SRTR GMC Ambajogai, India
[2]VD GMC, Latur, India

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Key Words
Colonic lesions, colon, pathological, histopathological, adenocarcinoma

Corresponding Author
Sambodhi C. Killarikar,
SRTR GMC Ambajogai, India

Author Designation
[1]Assistant Professor
[2]Associate Professor

Received: 24 November 2023
Accepted: 14 December 2023
Published: 15 December 2023

Citation: Sambodhi C. Killarikar and N.R. Patil, 2023. Studying the Clinical Profile of Colonic Lesions Along with Evaluation of Pathological and Histopathological Findings. Res. J. Med. Sci., 17: 330-335, doi: 10.59218/makrjms.2023.12.330.335

ABSTRACT
Colorectal cancer ranks second among the most common tumours of the world according to world cancer report 2000. The vital elements of the pathological assessment of colorectal carcinoma specimen include pathological determination of TNM stage, tumour type, histological grade, resected margin and vascular invasion. Histopathology is the gold standard in diagnosis of gastrointestinal lesions. Biopsies (histopathological interpretation) are sought for specific diagnosis, for determining extent of the disease, response to therapy as well as complications. The study was conducted for a period of two years at the Department of Pathology at Tertiary Health Care. Fivety two resected specimens of colon from patients with all relevant clinical details were included in the study. Tissue was processed routinely by fixing specimen 10% formalin followed by paraffin embedding. Tissue sections of 4-5 micro meter thickness are taken and was studied in details by staining with H and E stain. IHC and specials stains was used whenever necessary. Majority of the specimens received were of ascending colon and sigmoid colon i.e. 12(23.1%) each, followed by 6 specimens of transverse colon i.e. 11.5%. In 5 cases we received ascending and part of transverse colon (9.6%), in 3 cases we received Ascending colon with ileocolic junction and descending colon specimen i.e. 5.8%. Histopathological diagnosis in resected specimen revealed ischaemic colitis in 23 patients i.e. 44.2% followed by well differentiated adenocarcinoma of colon in 8 patients i.e. 15.4%, chronic non-specific colitis in 6 patients i.e. 11.5%, moderately differentiated adenocarcinoma of colon in 5 patients i.e. 9.6%. Conclusion- Commonly observed lesion on histopathology is Ischaemic colitis (44.2%), well differentiated adenocarcinoma of colon (15.4%) and chronic non-specific colitis (11.5%).

INTRODUCTION

Large intestine or colon extends from ileo-caecal junction to the anus. It is about 1.5-metre-long and is divided into caecum the ascending colon the transverse colon the descending colon the sigmoid colon the rectum and the anal canal. In the angle between the caecum and the ileum, there is a narrow diverticulum called the vermiform appendix. The greater part of large intestine is fixed, except for appendix, transverse colon and sigmoid colon. The lining epithelium is subject to variety of insults ranging from congenital anomalies, inflammatory, polyps, hamartomatous conditions, infections to neoplastic processes[1].Colorectal cancer ranks second among the most common tumours of the world according to world cancer report 2000. There is worldwide variation in the distribution of intestinal neoplasm, which appear largely due to exogenous factors rather than genetic[2]. Colorectal carcinomas are uncommon in our country when compared with the western world. The incidence in India is about 7/100000[3].

Majority of Colorectal carcinomas remain asymptomatic for years. They most often present with fatigue and weakness as these bulky lesions bleed readily and cause anaemia[4]. The treatment of choice for colorectal carcinoma is surgical resection. The postoperative outcome, prognosis and need for adjuvant therapy rely on the pathological assessment of resected specimen. The vital elements of the pathological assessment of colorectal carcinoma specimen include pathological determination of TNM stage, tumour type, histological grade, resected margin and vascular invasion[5]. High-grade dysplasia has been reported in up to 35% of villous adenomas that are greater than 1 cm in size[6]. The likelihood of encountering invasive cancer increases with increasing polyp size and approaches 85% in sessile polyps larger than 4 cm[7]. Carcinoma invasive to the submucosa has the potential to follow a biologically aggressive course[8,9]. In endoscopically removed sessile polyps with submucosal invasion, there is a 14% chance of recurrence or lymph node metastasis endoscopically. Small polyps are typically entirely removed endoscopically[10,11].

With the rapid therapeutic advancement in the era of personalized medicine, the role of pathologists in the management of patients with colorectal carcinoma has greatly expanded from traditional morphologists toclinical consultants for gastroenterologists, colorectal surgeons, oncologists and medical geneticists. In addition to providing accurate histopathologic diagnosis, pathologists are responsible for accurately assessing pathologic staging, analyzing surgical margins, searching for prognostic parameters that are not included in the staging such as lymphovascular and perineural invasion and assessing therapeutic effect in patients who have received neoadjuvant therapy. Pathologists also play a central role in analyzing histologic features of the tumors that are suggestive of microsatellite instability (MSI), selecting appropriate tissue sections for MSI testing and mutation analysis for KRAS and BRAF and interpreting the results of these important therapeutic and prognostic tests[12,13]. Histopathology is the gold standard in diagnosis of gastrointestinal lesions. Biopsies (histopathological interpretation) are sought for specific diagnosis, for determining extent of the disease, response to therapy and for detecting complications[14,15]. Hence, it will be useful to study and categorize different gastrointestinal lesions depending upon their histopathological appearances[15]. Both macroscopic and microscopic appearances along with clinical correlation helps in early treatment and better outcome of the patient[16,17]. The definitive diagnosis of gastrointestinal lesions largely depends on histopathological confirmation[18]. So the above study was conducted with the objective to assess the pathological and histopathological findings of the colonic lesions along with studying its clinical profile.

MATERIALS AND METHODS

Study place: The study was conducted at the Department of Pathology at Tertiary Health Care and Referral centre for a period of two years (July 2018 to June 2020).

Study design: Descriptive observational study.

Inclusion criteria: All the colonoscopic biopsies and resected specimens of colon received in the Department of Pathology.

Exclusion criteria: Poorly fixed/unfixed specimens, Inadequate biopsies in terms of no mucosal glands, only fibro-collagenous tissue etc.

Sample size: Fifty-two resected specimens of colon from patients with all relevant clinical details.

Data analysis: Data was collected by using a structure proforma and entered in MS excel sheet. Analyzed by using SPSS 24.0 version IBM USA. Qualitative data was expressed in terms of proportions. Quantitative data was expressed in terms of Mean and Standard deviation. Association between two qualitative variables was seen by using Chi square/Fischer's exact test. A $p<0.05$ was considered as statistically significant whereas a $p<0.001$ was considered as highly significant.

Ethical consideration: All the necessary ethical permissions were taken from the Institutional Ethics Committee before beginning the study. The detailed information of each patient including name, age, sex,

address, presenting complaints was noted in prescribed proforma. Gross examination of specimens received in Pathology department of tertiary health care and referral centre was done. Tissue was processed routinely by fixing specimen 10% formalin followed by paraffin embedding. Tissue sections of 4-5 micro meter thickness are taken and was studied in details by staining with H and E stain. IHC and specials stains was used whenever necessary.

RESULTS

Majority were from 61-70 year's age group i.e. 16 (30.8%) followed by 8 (15.4%) from 51-60 years, 7 each from 31-40 and above 70 year's age group. Least numbers were from 10 to 20 years i.e. 3(5.8%) and only one patient from less than 10 year's age group. The mean age of the study population was 52.46±19.28 years.

Clinical diagnosis in resected specimen revealed intestinal obstruction in 13 patients i.e. 25% followed by Colonic mass and Intestinal perforation in 6 patients i.e. 11.5% each, colitis and intestinal volvulus in 3 patients each i.e. 5.8%. Histopathological diagnosis in resected specimen revealed ischaemic colitis in 23 patients i.e. 44.2% followed by well differentiated adenocarcinoma of colon in 8 patients i.e. 15.4%, chronic non-specific colitis in 6 patients i.e. 11.5%, moderately differentiated adenocarcinoma of colon in 5 patients i.e. 9.6%. Distribution according to type of lesion and gender

Out of 52 specimens of colon, majority were non neoplastic i.e. 34 and remaining 18 were neoplastic lesions. Out of 34 non neoplastic lesions, 18 were males i.e. 52.9% and 16 (47.1%) were females. Out of 2 benign lesions, 1 were male and female i.e. 50%Out of 16 malignant lesions, 7 were males i.e. 43.8% and 9(56.2%) were females.

Histopathology diagnosis of colon: Out of 52 specimens, 15 were diagnosed histopathologically as adenocarcinoma of colon. Out of 15 cases of adenocarcinoma of colon, majority i.e. 8(53.3%) had well differentiated adenocarcinoma, 5(33.3%) had moderately differentiated adenocarcinoma and one each had poorly differentiated and mucinous adenocarcinoma of colon.

In our study, total 15 cases of adenocarcinoma of colon were noted. Out of these 15 colonic malignant lesions, 2 specimens were biopsies. So, we have classified 13 colectomy specimens according to Duke's system modified by Astler Coller staging. Out of 13 specimens, 5 cases (38.46%) belonged to stage B2, 4 cases (30.76%) belonged to stage C2, 2 cases (15.38%) were from stage D, and 1 case (7.69%) each belonged to stage B1 and C1. There was no any case of stage A observed in our study.

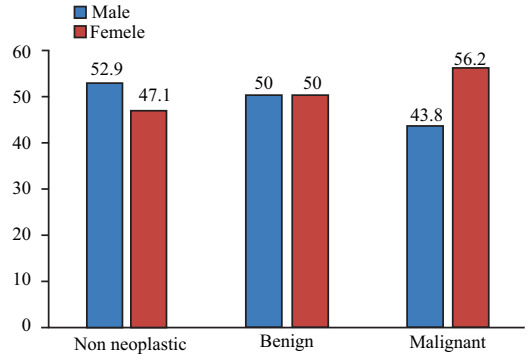

Fig. 1: Bar diagram showing distribution according to type of lesion and gender

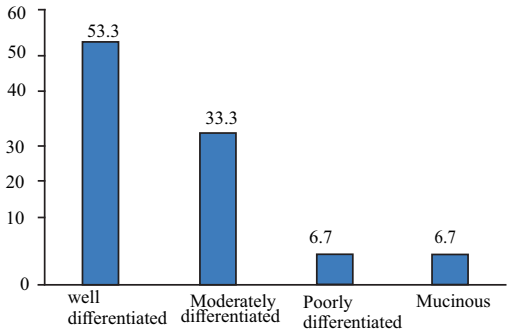

Fig. 2: Bar diagram showing histopathology diagnosis of colon

Table 1: Distribution according to age group

Age group (years)	Frequency	Percentage
<10	1	1.9
10-20	3	5.8
21-30	4	7.7
31-40	7	13.5
41-50	6	11.5
51-60	8	15.4
61-70	16	30.8
>70	7	13.5
Total	52	100.0

Table 2: Distribution according to pain in abdomen

Pain in abdomen	Frequency	Percentage
Yes	36	69.2
No	16	30.8
Total	52	100.0

Abdominal pain as chief complaint was seen in 36 patients i.e. 69.2%

Table 3: Distribution according to blood in stool

Blood in stools	Frequency	Percentage
Yes	17	32.7
No	35	67.3
Total	52	100.0

Blood in stools as chief complaint was seen in 17 patients i.e. 32.7%

DISCUSSIONS

In above study, out of 16 malignant lesions of colon, majority were from 61-70 year's age group i.e. 5(9.6%) followed by 4(7.7%) from 51-60 years and above 70 years each. One patient each was from 10-20, 31-40-and 41-50-years age group reported. Santos *et al.*[19] evaluated the malignancy of colorectal lesions and reported that the mean age of the patients was 67.4 years. A study by Das *et al.*[20], which was a large collaborative study from 3 tertiary institutes of our country (AIIMS-Delhi, SGPGI Lucknow and IPGMER-Kolkata) also reported mean age of patients being

Table 4: Distribution according to clinical diagnosis

Clinical diagnosis	Frequency	Percentage
Acute intestinal perforation	2	3.8
Colitis	3	5.8
Intestinal obstruction	13	25.0
Sigmoid volvulus	3	5.8
Colonic mass	6	11.5
Bowel gangrene	2	3.8
Carcinoma colon	3	5.8
Abdominal mass	2	3.8
Intestinal intussusception	1	1.9
Intestinal perforation	6	11.5
Intestinal obstruction with intussusception	1	1.9
Acute intestinal perforation with pan colitis	1	1.9
Adenomatous polyp	1	1.9
Polypoidal mass	1	1.9
Incisional hernia with gangrenous colon	1	1.9
Perforative peritonitis	1	1.9
Intestinal volvulus	3	5.8
Rectosigmoid mass	1	1.9
Peritonitis	1	1.9

Table 5: Distribution according to histopathological diagnosis

Histopathological diagnosis	Frequency	Percentage
Ischaemic colitis	23	44.2
Chronic non-specific colitis	6	11.5
Acute non-specific colitis	1	1.9
Well differentiated adenocarcinoma of colon	8	15.4
Moderately differentiated adenocarcinoma of colon	5	9.6
Poorly differentiated adenocarcinoma of colon	1	1.9
Mucinous adenocarcinoma of colon	1	1.9
Gastrointestinal stromal tumour	1	1.9
Diversion colitis	2	3.8
Diverticulitis	1	1.9
Ulcerative colitis	1	1.9
Tubulovillous adenoma with mild dysplasia	1	1.9
Tubulovillous adenoma with high grade dysplasia	1	1.9

34.5 years. Majority of colonic tumours are seen in the sigmoid colon and the rectum. In recent years there is evidence of increasing proportion of proximal tumours. In high-risk countries colorectal cancer most commonly arises in the recto-sigmoid region, but though we fall in the low-risk countries we encountered more lesions in the distal region may be due to environmental factors or easy approachability which made them to be detected at an early stage as many of these are well differentiated adenocarcinomas[21].

Histopathological diagnosis in resected specimens revealed Ischaemic colitis in 23 patients i.e., 44.2% followed by Chronic non-specific colitis in 6 patients i.e., 11.5% and diversion colitis in 2 patients i.e., 3.8%. Diverticulitis and ulcerative colitis were diagnosed in one patient each i.e., 1.9%. Chityala Jyothi *et al.*[22] in their study revealed that out of the 320 cases of non-neoplastic lesions predominant lesions were chronic non-specific colitis constituting 187 cases (58.44%) which is higher than our findings. Our findings are consistent with the findings by Sidney *et al.*[24] (61.3%) and Chityala Jyothi *et al.*[22] (63.12%) whereas Teague *et al.*[23] 43.9% observed less prevalence. The incidence of non-neoplastic lesion i.e., ischemic colitis is high in our study as compared to neoplastic lesions of the colon as the superspeciality in gastroenterology is not available in our tertiary care centre. Such patients are referred to higher centres for further management and operative interventions. Ischaemic colitis is highest in the age group of 61-70 years (21.73%) and 31-40 years (21.73%) in our study. Out of 23 cases of ischaemic colitis, 7 cases (30.43%) were associated with hernias, diabetes mellitus having bacterial infections of colon were observed in 6 cases (26.08%), atherosclerosis leading to hypoperfusion was seen in 5 cases (21.73%) and chronic constipation with fecal impaction was seen in 5 cases (21.73%).

Our findings of non-neoplastic lesion are comparable with Sidney *et al.*[24] and Azar Quyyum *et al.*[25] and contrast as suggested by Teague *et al.*[23] Our findings of malignant lesions are comparable with Teague *et al.*[23] and contrast as suggested by Sidney *et al.*[24] and Azar Quyyum *et al.*[25]. Our findings of benign lesions are very less as compared with Teague *et al.*[23], Sidney *et al.*[25] and Azar Quyyum *et al.*[25].Out of 52 specimens, 15 (28.8%) were diagnosed histopathologically as adenocarcinoma of colon. Out of 15 cases of adenocarcinoma of colon, majority i.e. 8(53.3%) had well differentiated adenocarcinoma, 5(33.3%) had moderately differentiated adenocarcinoma and one each had poorly differentiated and mucinous adenocarcinoma of colon. Santos *et al.*[19] reported 72 adenomas (20 tubular, 42 tubulo-villous, 8 villous and 2 serrated adenomas) and 4 adenocarcinomas i.e.5.3% (3 intramucosal carcinomas and 1 invasive). Among the adenomas, 29 (40.3%) of the lesions presented high-grade dysplasia. The prevalence is less in this study compared to our findings.

Inflammatory infiltrates were significantly seen in inflammatory lesions in our study. Hence, we have highlighted this just to show the inflammatory etiology of colon. Neoplastic lesions were showing sparse, insignificant inflammatory infiltrate. Inflammatory infiltrates revealed mixed type in 19 cases i.e. 36.5% followed by insignificant in 18(34.6%), mononuclear in 13(25%) and polymorphonuclear in 2 cases i.e. 3.8 Mucinous adenocarcinoma showed a higher proportion of high-grade tumours. The adverse prognostic effect of mucinous adenocarcinoma can be explained by more advanced stage at presentation. Mucin content when considered together with histological grade can be regarded as important prognostic indicators [26]. The strongest predictor for the presence of invasive carcinoma is high-grade dysplasia, and every effort should be made to detect its presence. However, it is the invasive carcinoma that has biologic significance. From our probability studies, it is evident that 1 cassette per centimeter of polyp is insufficient to detect either high- grade dysplasia or

invasive carcinoma. The number of cases with an estimated probability of 95% or more of detecting high-grade dysplasia or invasive carcinoma increases with the number of cassettes submitted per centimeter. Theoretically, in some cases, 5 cassettes per centimeter would be required to detect either high- grade dysplasia or invasive carcinoma with an estimated probability of 95% or more. In practice, however, most of the adenomas were totally embedded in fewer (3/cm on average) cassettes. Therefore, totally embedding large, benign-appearing adenomas is necessary to have the best possibility of detecting invasive carcinoma[27].

CONCLUSION

Commonly observed lesion on histopathology is Ischaemic colitis (44.2%), well differentiated adenocarcinoma of colon (15.4%) and chronic non-specific colitis (11.5%). Prevalence of non-neoplastic lesions in our study was 65.4%. Prevalence of neoplastic lesions in our study was 34.6%. Majority of the malignant lesions were seen in above 60 year's age group.

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