Original Article

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Pathology Section

Histopathological and Clinical Evaluation of Non Neoplastic Intestinal Lesions: A Cross-sectional Prospective Study in a Quaternary Care Centre, Gujarat, India

NANDA NIKUNJ JAGRIT[1], RAJUL R SHAH[2], DHARA J MODI[3], KILLOL NATHUBHAI DESAI[4]

ABSTRACT

Introduction: Small and large intestines are major portion of gastrointestinal tract. So many benign, malignant and congenital disorders arise from there. Benign causes, mainly include inflammatory and infectious disorders. Colon is the most common site for gastrointestinal neoplasia in western populations.

Aim: To find out the pattern, frequency and site of non neoplastic lesions affecting intestine with intention that clinicians of this region can be responsive of its incidence.

Materials and Methods: A prospective cross-sectional study was done at a quaternary care centre from June 2017-October 2019. Total 150 cases were studied, out of those 125 were benign and 25 were malignant cases. Patients of all ages were included with sign and symptoms of intestinal lesions.

Results: Majority of specimens were bowel resection 130 (86.7%) and remaining were endoscopic biopsy 20 (13.3%). Majority of lesions were inflammatory lesions (73.34%) followed by malignant lesions (16.66%). Congenital and benign lesions were less common (6% and 4%). Non neoplastic lesions 125 (83.33%) were more common than neoplastic lesions 25 (16.67%). A 65.33% lesions were in small intestine and caecum and 34.67% were in colon and rectum. Non specific inflammation was most common type (47.90%). Hirsprung's Disease and Ulcerative Colitis lesions were least common (1.69% and 3.36%) in present study.

Conclusion: Accurate macroscopic and microscopic examination of specimens which are associated with clinical data helps to reach at definite goal and can improve quality of life of the patient.

Keywords: Bowel resection, Endoscopic biopsy, Hirschsprung's disease, Ulcerative colitis

INTRODUCTION

Major portion of gastrointestinal tract is formed by small and large intestine. Benign, malignant and congenital disorders arise from small and large intestine. Benign causes, mainly include inflammatory and infectious disorders. In western populations, colon is the most common site for gastrointestinal neoplasia [1]. The gut disorders show very vague signs and symptoms. By the time signs and symptoms are observed, the disorders reach the advanced stage [1,2]. For early diagnosis, analysis of the clues and effect of lesions on the body are required. The spectrum of intestinal lesions is very broad affecting all age groups. Due to many antigens present in food and gut microbes, the immune system of the small and large intestine is affected. Many intestinal bacteria are present in our body and they out-number than intestinal cells by ten-fold. Thus, it is not surprising that the large bowel is frequently involved by infectious and inflammatory processes [2]. The large intestine and anal canal are sites for many benign, malignant and congenital disorders, which can lead to various serious complications. They can be the site for various infections, vascular, ulcerative, inflammatory and neoplastic disorders [1,2]. Congenital disorders like Hirschsprung's disease and Meckel's diverticulum of intestine are more significant cause of morbidity in children than in adult [3]. Histopathological study is the gold standard for the diagnosis of intestinal lesions. The present study was undertaken to find out the pattern, frequency and site of non neoplastic lesions affecting large bowel with intention that clinicians of this region can be responsive of its incidence. For better outcome of the patient early diagnosis and treatment is needed. Accurate macroscopic and microscopic examination of specimens which are associated with clinical data helps us to reach at our definite goal of better outcome of patient.

MATERIALS AND METHODS

A cross-sectional prospective study was conducted after taking Human Ethics Research Committee (HERC) approval (AMC MET/HERC/PG/PATHO/23/2017) from June 2017-October 2019 which included 150 patients giving informed consent with sign and symptoms of intestinal lesions who were operated by Department of Surgery of our quaternary care centre.

Inclusion criteria: Males and females of all age groups having intestinal lesions, all the patients clinically having intestinal lesions operated by surgery department, the entire specimen of intestine or biopsy received at histopathology section of Pathology department were included in the study.

Exclusion criteria: Inadequate biopsy material, specimens of appendicectomy were not included.

Study Procedure

For each case, a brief clinical history and investigational findings were taken. Age, clinical signs and symptoms, indication of biopsies and type of biopsies were also reviewed. Only one dominant diagnosis related to intestinal lesion was considered and documented as the indication for the procedure.

Bowel resection and endoscopic biopsy specimens were studied grossly as well as microscopically. After receiving the surgical specimens in 10% formalin at the Department of Pathology, detailed gross examinations of whole specimen was done. For fixation purpose, additional cuts were made based on the size of the specimen and morphology of representative cut sections was recorded.

The tissue bits from representative area were taken for tissue processing and paraffin blocks were prepared. The blocks were sectioned and routinely stained with Haematoxylin and Eosin (H&E)

stain. Detailed findings and microscopic features were evaluated and recorded.

The histopathology requisition forms submitted along with specimen were reviewed for intraoperative findings by the concerned surgeon. In case of any inadequacy in the history, the concerned treating surgeon was consulted for further information. Microscopic and macroscopic findings or any incidental findings were documented in the final report.

Thereafter, various data were collected from bowel resection and endoscopic biopsy specimens like various indications for performing biopsies, types of lesions identified in the histopathological examination, percentage of cases in which clinical diagnosis were associated with the histopathological finding, frequency of unexpected diseases or pathologies, various pattern of occurrence of different pathologies in relation to age and mode of presentation of patients.

STATISTICAL ANALYSIS

Analysis was done by the Statistical Package of Social Sciences software (version 15.0; SPSS). Microsoft Excel 2007 was used and descriptive method of statistical analysis to evaluate the different parameters of the study.

RESULTS

Majority of specimens were bowel resection 130 (86.7%) and remaining were endoscopic biopsy 20 (13.3%). Gender distribution shows, 92 (61.3%) were males and 58 (38.7%) females with male:female ratio of 1.6:1. The age distribution is shown in [Table/Fig-1]. There was variation in the incidence of intestinal lesions with the peak age of intestinal lesions between 41-50 years followed by 31-40 years and 51-60 years. Lowest numbers of patients were in the age group more than 80 years. [Table/Fig-2] shows distribution of patients according to the type of intestinal lesions. Among the total cases, majority were inflammatory lesions (73.34%) followed by malignant lesions (16.66%). [Table/Fig-3,4] shows distribution of patients according to the type and site of intestinal lesions. Among the total cases, non neoplastic lesions 125 (83.33%) were more common than neoplastic lesions 25 cases (16.67%). Among all lesions, 65.33% lesions were in small intestine and 34.67% were in large intestine. [Table/Fig-5] shows distribution of non neoplastic lesion according to histopathology. Among them, non specific inflammations were most common type (47.90%). Hirsprung's disease and ulcerative colitis lesions were least common (1.69% and 3.36%) in present study [Table/Fig-6,7]. Abdominal pain was the most common symptom of small intestinal lesions followed by jaundice and vomiting [Table/Fig-8]. Constipation was the most common symptoms of large intestinal lesions followed by abdominal pain and weight loss [Table/Fig-9].

Age (years)	Number	Percentage	Non neoplastic	Neoplastic
0-10	05	03.33	05	00
11-20	16	10.67	15	01
21-30	20	13.33	15	05
31-40	25	16.67	21	04
41-50	32	21.33	26	06
51-60	25	16.67	19	06
61-70	19	12.67	11	08
71-80	07	04.67	06	01
>80	01	0.66	01	00
Total	150	100	119	31

[Table/Fig-1]: Distribution of intestinal lesions according to age.

Intestinal lesions	No. of cases	Percentage
Congenital	09	6.0
Inflammatory	110	73.34
Benign	06	4.0
Malignant	25	16.66
Total	150	100

[Table/Fig-2]: Distribution of Intestinal Lesions According to Type: Inflammatory lesions are more common than others.

Site	Non neoplastic	Neoplastic	Total	Percentage
Small intestine	93	05	98	65.33
Large intestine	32	20	52	34.67
Total	125 (83.33)	25 (16.67)	150 (100)	

[Table/Fig-3]: Distribution of intestinal lesions according to type and site of lesion.

Major site	Lesion	Particular site	N (%)
Small intestine	Acute necrotising inflammation	Ileum	18 (14.4)
	Acute suppurative inflammation	Ileum	16 (12.8)
	Gangrene	Ileum	12 (9.6)
	Peptic ulcer	Duodenum	13 (10.4)
	Peptic ulcer with perforation	Duodenum	12 (9.6)
	Acute infarction	Ileum	1 (0.8)
	Tuberculosis	Jejunum (2), Ileum (6)	8 (6.4)
	Meckel's diverticulum	Distal Ileum	9 (7.2)
	Acute on chronic enteritis	Ileum	1 (0.8)
	Necrotising granulomatous inflammation	Jejunum (1), Ileum (2)	3 (2.4)
Total			93 (74.4)
Large intestine	Non specific inflammation	Colon	10 (8)
	Haemorrhoids	Anal canal	8 (6.4)
	Ulcerative colitis	Colon	4 (3.2)
	Fistula	Anal canal	2 (1.6)
	Amoebic colitis	Caecum with ascending colon	1 (0.8)
	Tuberculosis	Caecum	4 (3.2)
	Bacterial colitis	Colon	1 (0.8)
	Hirschsprung's disease	Colon	2 (1.6)
Total			32 (25.6)
Final total			125 (100)

[Table/Fig-4]: Distribution site of non neoplastic intestinal lesions according to histopathology.

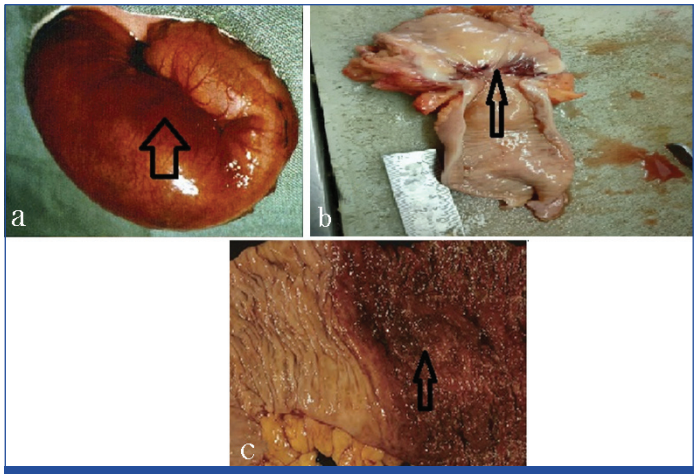
Type	No. of cases	Percentage
Non specific inflammation	57	47.90
Inflammation with gangrene	12	10.08
Inflammation with perforation	12	10.08
Inflammation with ulceration	13	10.93
Tuberculous inflammation	12	10.08
Meckel's Diverticulum	07	5.88
Ulcerative colitis	04	3.36
Hirschsprung's disease	02	1.69
Total	119	100

[Table/Fig-5]: Distribution of non neoplastic lesion according to histopathology.

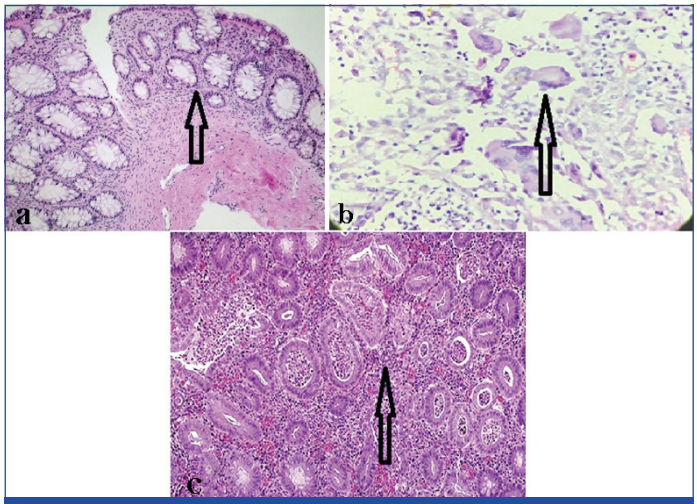
DISCUSSION

Out of total 150 cases of intestinal lesions studied in the present study; 125 cases were non neoplastic and 25 cases were neoplastic lesions. Among non neoplastic lesions the most common type was inflammatory lesion and in 25 cases of malignant, lesion most common type was moderately differentiated adenocarcinoma.

Out of total 150 cases of intestinal lesions, most of the cases were seen between 21-70 years of age group, maximum cases were observed between 41-50 years (21.3%). Karve SH et al., showed most of cases between 21-70 years, majority of cases



[Table/Fig-6]: Gross specimen: (a) Dilated bowel loop in Hirschsprung's disease: Normal anus, small rectum and anal canal without stool and dilated proximal bowel is seen, (b) Intestinal stricture in tuberculosis: Multiple, circumferential ulcers and strictures are present at the site of lesion, (c) Ulcerative colitis: Petechial haemorrhages are seen. Elevated sessile reddish nodules, known as pseudo polyps are often seen. They are typically small and sessile.



[Table/Fig-7]: (a) Hirschsprung's disease: No ganglion cells in the submucosa of the rectum. (H&E 10X), (b) Giant cells in granuloma in tuberculosis (H&E 40X), (c) Ulcerative colitis: Active phase showing crypt abscess and cryptitis (H&E 10X).

Symptoms	No. of patients	%
Abdominal pain	81	87.1
Diarrhoea	33	35.5
Constipation	16	17.2
Jaundice	53	57
Vomiting	41	44.1
Abdominal swelling	4	4.3
Fever	19	20.4
Weight loss	16	17.2
Anaemia	7	7.5
Dark- black colour stool	5	5.4

[Table/Fig-8]: Distribution of various clinical symptoms of small intestinal lesions (n=93).

Symptoms	No. of patients	%
Constipation	29	90.6
Bleeding per rectum	7	21.9
Abdominal pain	22	68.7
Diarrhoea	6	18.8
Something come out from anal canal	8	25
Abdominal swelling	2	6.25
Weight loss	15	46.9

[Table/Fig-9]: Distribution of various clinical symptoms of large intestinal lesions (n=32).

were observed between 31-40 (20.7%) and 41-50 (20.1%). This corresponds with findings of the present study [4]. Al-Aquili HA et al., which observed most of cases between 21-60 years, majority of cases observed in (21-30 years) -24.3% and (31-40 years) -23.2% [5]. In the present study, peak age of total 35 inflammatory lesion of large intestine was noted in the 4th decade which corresponds with the study by Monsen U [6]. Present study showed male preponderance which was in accordance with the studies of Monsen U and Gismera SC et al.,[6,7].

In the present study, out of total 150 cases of intestinal lesions, majority of non neoplastic lesions (83.33%) compared to other types of intestinal lesions which was similar with study of Chennakeshaviah GRP et al., Sulegaon R et al., and Rajbhandari M et al., [8-10]. In the present study, total 12 cases of tuberculosis show slightly male predominance (58.33%) which was in accordance with Leung VKS et al., (59.09%) [11]. Age of presentation of Hirschsprung's disease was ranges from 50-60% in the neonatal period and 40% in the postnatal period [11]. In the present study, total two cases are equally presented in both period which correlates with that of Anupama B et al. and Jung PM et al., they who also reported cases in the same range [12,13].

Perforation was the commonest gross pathological findings. This finding is comparable with the study of Agarwal N et al., [14]. Many vague symptoms of small intestinal lesion they can be mild abdominal pain to severe acute abdominal pain, jaundice, vomiting, abdominal mass, weight loss, diarrhoea, constipation and anaemia. So, whenever above sign and symptoms were observed, detailed investigations of small intestine should be done. Constipation was the most common symptoms of large intestinal lesions followed by abdominal pain and weight loss, which corresponds with the Sulegaon R et al., [9].

The commonest site of tuberculosis was ileum. In this study, there were total 12 patients of tuberculosis. Out of those, eight cases of small intestine and four cases of large intestine. Ileum was the most common site for tuberculosis which was comparable with Chennakeshaviah GRP et al., [8]. A study by Pulimood A et al., differentiates between tuberculosis and Crohn's disease with the help of following microscopic examination-

- Caseation necrosis
- Well-formed granulomas
- Lymphoid infiltration
- Granulomas more than 400 micrometres
- 5 or more granulomas in biopsies from one segment
- Location of granulomas or granulation tissue in the submucosa: often with arrangement of histiocytes.
- Irregular submucosal inflammation [15].

All cases had past history of pulmonary Koch's and in histopathological examinations classical granulomas were observed [Table/Fig-6,7].

Most common lesion diagnosed was peptic ulcer in present study which was comparable with Patel P and Bhalodia J [16]. All of those patients with ulcer were presenting acute abdominal pain. Microscopic examination showed a necrotic zone, superficial exudative zone, granulation tissue zone and cicatrisation zone.

In present study, four cases of ulcerative colitis were found and all were male patients. They presented with abdominal pain, diarrhoea and per rectal bleeding. Histology showed mucosal infiltration with inflammatory cells, cryptitis and crypt abscess. Sulegaon R et al., found that the mean age of ulcerative colitis arise was between 35-36 years [9]. Abdominal pain and per rectal bleeding are the commonest symptoms observed by Sulegaon R et al., [9]. Findings of this study well correlated with the above-mentioned studies.

Two cases (1.6%) of Hirschsprung disease were noted [Table/Fig-6,7]. In the present study, total two cases were equally presented in both periods. The study by Zaid F et al., found that the commonest

age range was 1 day to 13 years between which the Hirschsprung disease cases were found. The cases peak is during the neonatal period [17].

Limitation(s)

Appendicectomy specimens were not included in this study. Endoscopic biopsies with inadequate biopsy material were not included in present study. We also not studied malignant lesions of both small intestine and large intestine.

CONCLUSION(S)

The histopathological examination is must for diagnosis of intestinal lesions because of both small and large intestines were affected by various conditions like infections, ulcerative, inflammatory, polyp, non neoplastic and neoplastic tumours etc. The radiological findings and clinical presentations were different from person to person and they are non specific also. Thus histopathological examinations are must for definitive diagnosis. Ulcerative colitis is important to diagnose early so it prevent chances of developing colorectal carcinoma. Many intestinal lesions present with vague signs and symptoms prevent early diagnosis and treatment. Sometimes late diagnosis and treatment lead to major complications. This study mainly emphasises on early diagnosis with the help of histopathology, clinical presentation and radiological findings. This can help to surgeon/clinicians to implement the appropriate surgical/medical procedures and thus improve the survival of the patients. Accurate macroscopic and microscopic examination of specimens which are associated with clinical data and proper radiological findings help to reach at definite goal.

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PARTICULARS OF CONTRIBUTORS:

1. Associate Professor, Department of Pathology, AMC MET Medical College, LG Hospital, Ahmedabad, Gujarat, India.
2. Assistant Professor, Department of Pathology, Smt. N.H.L. Municipal Medical College, Ahmedabad, Gujarat, India.
3. Consultant Pathologist, Department of Pathology, Kothiya Hospital, Unipath Branch, Ahmedabad, Gujarat, India.
4. Associate Professor, Department of Pathology, Nootan Medical College and Research Centre, Visnagar, Mehsana, Gujarat, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:
Dr. Killol Nathubhai Desai,
Associate Professor, Department of Pathology, Nootan Medical College and Research Centre, Visnagar, Mehsana-384315, Gujarat, India.
E-mail: drkilloldesai@gmail.com

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