ORIGINAL RESEARCH PAPER

Pathology

FORMS OF NON-NEOPLASTIC COLONIC BIOPSIES: HISTOPATHOLOGICAL INTERPRETATION OF FIVE YEARS OBSERVATION.

KEY WORDS: Non-neoplastic, colonic biopsies, Histopathology.

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ABSTRACT

Colorectal troubles are frequently common in medical practice ranging from mild nonspecific complaints to serious suffering. Colonic mucosal biopsies are considering one of the diagnostic tool in the evaluation of patients with colorectal pathologies. The objectives of this study are focusing for interpretation various spectrum of colonoscopic biopsies and to provide a guide to the plan of management strategy. This retrospective study was including 250 colonoscopic biopsies collected during the from December 2015 through January 2020. Among them 160 cases were of the Non-Inflammatory Bowel Disease Colitis (NIBDC) entities whereas, remaining 90 cases were Inflammatory Bowel Disease (IBD). Among the first one, 100 (40%) cases were Non-specific colitis, 13 (5.2%) bacterial colitis, 2 (0.8%) collagenous colitis, 15 (6%) hyperplastic polyp, 5 (2%) Peutz-Jeuger's polyps, 5 (2%) solitary rectal ulcer, 4 (1.6%) eosinophilic colitis, 3 (1.2%) Juvenile polyp, and 3 (1.2%) were melanosis coli, and remaining 10 (4%) cases were unremarkable. In regard to the IBD, 60 cases (24%) were ulcerative colitis and 30 (12%) Crohn disease. Majority of colonic troubles are linked to non-specific pathologies whereas, IBD is considering the second detectable colonic lesions in our study.

INTRODUCTION

The colon is most common GIT portion involved by numerous insults. Basically, two major non-neoplastic disorders causing colonic suffering. These disorders are lying under Non-Inflammatory Bowel Disease Colitis (NIBDC) and Inflammatory Bowel Disease (IBD). The first group are sharing many clinical findings and endoscopic features with the IBD group yet, there are peculiar histological features and therefore divergent clinical and therapy outcomes ***(Villanacci et al., 2020)***. In the clinical practice, most of the above colonic lesions are presenting with many variable abdominal symptoms ranging from non-specific bowel habits to serious bleeding and any delay in diagnosis may lead to sophisticated complications. Early detection and proper management are essential to reduce the morbidity and mortality ***(Chityala 2016)***. Colonoscopy and histopathogical assessment of any obtained biopsies are directing for accurate diagnosis and treatment of colonic pathologies so, they reducing many unwanted surgical procedures ***(Abilash and Shreelakshmidevi 2017, and Cappel and Friedel 1986)***. One of the most critical colonic pathology is chronic idiopathic inflammatory bowel disease (IBD). Biopsy assessment of for IBD is important for accurate diagnosis, specific entity, determination of activity, and grading of any associated dysplasia ***(Roger 2020)***. Two forms of colitis are included under the entity of microscopic one which are collagenous colitis (CC) and lymphocytic colitis (LC). In the two entities there are watery diarrhea, normal endoscopical mucosa findings yet, they having distinct histopathological findings (Maurice 2020).

MATERIALS AND METHODS

The present study was performed on tissue sections specimens of 250 patients. All the investigated specimens were biopsies which obtained from the large bowel. Any resections samples were excluded from the study. These biopsies were taken endoscopically in the endoscopic unit. The study was performed in the Department of Histopathology, Regional laboratory, KSA, through the period from December 2015 through January 2020. All the clinic-endoscopical findings of the patients including age, gender, and clinical complaints were obtained from patient's medical records and referral enclosed requests. All the surgical specimens were received fixed in 10% neutral buffered formalin solution, then processed and paraffin-embedded blocks were prepared, and were cut into 3 micron-thick tissue sections. The preformed paraffin sections were stained by Hematoxylin and Eosin stains. All the stained sections examined microscopically (by 2 experienced pathologists). All the tissue sections were assessed histologically for ulcerations or erosions, architectural abnormalities including branching / shortening / architectural abnormalities including crypt branching / shortening / density, as well as, inflammatory infiltrates including transmural extension, activity and neutrophilic crypt involvement including cryptitis and crypt abscess formation, granulomas, infestations of organisms, and any associated dysplastic changes ***(Moore et al., 2020)***. Finally, the prepared sections examined for any polypoid lesions as hamartomatous, hyperplastic polyps and pigmentation.

RESULTS

1- Clinico-colonosopical findings

A total of 250 cases of patients included in this study,

comprised of 170 (68%) men and 130 (32%) women. The female/male (F/M) ratio was 1.3:1. The patients' age ranged from 15-75 year, with an average age of 30.Majority of patients were in the age group 26-45 years. Symptoms were variable from abdominal pain to weight loss yet, majority of our patients were complaining of abdominal discomfort ***(Table 1)***. All our patients seen in the endoscopic unit suffering from the above GIT troubles, after clinical examination and routine investigations done, lower GIT colonscopical examination done and various biopsies were taken. The endoscopic manifestations were ranged from nothing to polyps ***(Table 2)***. In regard to biopsies sites, majority of them were from the rectosigmoid colon and representing 56%, whereas the least site was the ileum in conjunction with cecum and representing 4%. Additionally, majority of colonscopical findings was inflamed mucosa with congestive changes and erosion that seen in 26% of cases, whereas ulcerations noted in 14% of the studied cases ***(Table 3).***

5.2- Histopathological findings

Histologically colon is a hollow structure and composed of four layers: mucosa, submucosa, muscularis externa (propria), and serosa. Normally lymphocytes and occasional eosinophils can be distributed in the lamina propria and in the surface epithelial cells ***(Figure 1) (Shamsuddin et al., 1982)***.

This series study revealing various entities of NIBDC was observed in 160 cases (64%) whereas, The IBD types found in the remaining 90 cases (36%) ***(Table 4)***. In regard to the first group, majority of the examined mucosal biopsies were revealing no specific pathological abnormalities yet, variable mononuclear inflammatory infiltrates and diagnosed as the entity of non-specific colitis and representing 40% of cases ***(Figure 2)***. In regard to specific forms of colitis with focusing on inflammatory bowel disease (IBD) were diagnosed in 90 cases (36%) out of all the included mucosal biopsies. Among them, ulcerative colitis (UC) was representing the major specific pathological entity of IBD and seen in 60 cases (24%) ***(Figures 3&4)***, followed by crohn disease (CD) ***(Figure 5)*** that found in 30 cases (12%). In regard to specific histopathol ogical findings for IBD, crypt distortion found in all cases diagnosed as IBD (36%), ulcerations in 6%, cryptitis in 12%, crypt abscess in 8%, whereas, granuloma in 2% and dysplasia was seen 2.5% out of the examined biopsies ***(Table 4)***.

RESULTS:

Table 1: Clinicoendoscopical findings among all included cases.

Age		Gender		Clinical manifestations		Endoscopical manifestations	
	# of cases	Males	Females		#		# of cases
15-25	110	170	130	Abdominal discomfort	70	Intact mucosa	65
26-45	53		Vomiting, Pain & diarrhea	50		Inflamed mucosa with erosions	250
46-55	42		Bloody diarrhea	65		Ulceration	35
			Mucoid Diarrhea	35		Strictures	15
56-65	30						
			Bloody diarrhea & weight loss	30		Polypoid changes	20
						Co-features	20
66-75	15						
Total #		250					250

Table 2: Anatomical distribution and biopsy sites of all studied cases:

Site	Number of patients
Rectosigmoid biopsies	140
Recto-anal region	40
Descending colon	20
Transverse colon	15
Ileo-cecal biopsies	10
Random colonic biopsies	25
Total	

Table 3: Histopathological Diagnosis of all studied colonic biopsies:

NIBDC		IBD	
Non-specific colitis	100	UC	60
Bacterial colitis	13	CD	30
Solitary rectal ulcer	5	Total	90
Melanosis coli	3		
Eosinophilic colitis	4		
Collagenous colitis	2		
Hyperplastic polyps	15		
Peutz-Jehegers polyps	5		
Juvenile polyp	3		
Unremarkable pathology	10		
Total	160		

NIBDC: Non-Inflammatory Bowel Disease Colitis; IBD: Inflammatory Bowel Disease; UC: Ulcerative Colitis; CD: Crohn Disease.

Table 4: Specific Histopathological findings from cases of IBDs.

Crypt abnormalities		Mucosal-epithelial changes		Inflammation		Associations	
	# of cases		# of cases		# of cases		# of cases
Branching	40	Intact mucosa	50	Transmural	20	Dysplasia	6
Shortening	10	Erosions	20	Cryptitis	30	Cancer	1
↓ density	25	Ulcerations	15	Crypt abscess	20		
Branching with ↓ density	15	Granulomas	5	Granulomas	5		
				Mucin depletion	5		
Total	90	Total	90	Combined	10		
				Total	90		

2: Figures.

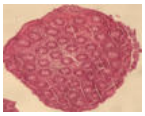

Fig 1: Colonic mucosal biopsy showing unremarkable mucosa (X40).

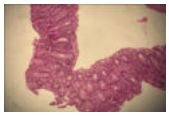

Fig 2: Colonic mucosal biopsy revealing non-specific colitis (X100).

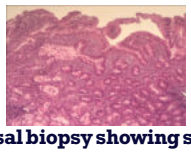

Fig 3: Colonic mucosal biopsy showing severe erosion, crypt architectural distortion, cryptitis and crypt abscess in UC (X200)

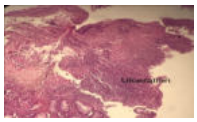

Fig 4: Colonic mucosal biopsy showing severe ulceration, granulation tissue and crypt architectural distortion in UC (X200)

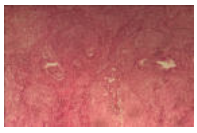

Fig 5: Colonic mucosal biopsy showing epithelioid granulomas, cryptitis and crypt abscess in CD (X200).

DISCUSSION

Colonic diseases are considering health problems worldwide, early lesions of the colon are associated with non-specific symptoms. Hence, colonoscopic examination in association with colonic biopsies are a very useful tool for the early detection and accurate diagnosis of colonic lesions. Non-neoplastic colorectal disease forms a considerable portion of the daily workload for practicing pathologists (and endoscopic operators alike and represents a major worldwide health and economic issue ***(Moore et al. 2020 & Geetha et al., 2018)***. In regard for accurate diagnosis and better outcome of the most serious inflammatory bowel disease of both types, summation of data including clinical, colonoscopic and histological findings are crucial in this manner ***(Magro et al, 2013)***. In the same theme, among the non-neoplastic lesions affecting the colon, various diseases including infections, polyps, inflammatory diseases, and a major morphological heterogonous lesion termed idiopathic inflammatory bowel disease (IBD) that including two major types, Ulcerative colitis (UC) and Crohn disease (CD) are representing the commonest categories. Also there are overlapping among the symptoms in the colonic diseases that making a hesitating clinical diagnosis ***(Padma 2018 and Abilash and Shreelakshmidevi 2017)***. A study mentioned 50% of the diagnosis of colon biopsies are related to microbiological factors, and a proportion of cases is linked to diagnostic IBD. The rest of cases is distributing through microscopic colitis, eosinophilic colitis, diverticular colitis disease, and ischemic colitis ***(Karabulut and Ensar 2012)***.

In this series the patient complains are divergent ranging from abdominal discomfort to bleeding per rectum. Chronic diarrhea is considering one of the most common indicator of colonoscopy to our patients included in this study. Various researchers were discussing that this disorder is quite diverse and is related to various intestinal disorders including non-neoplastic and neoplastic. The most common cause of chronic diarrhea is in non neoplastic conditions is IBD whether UC and Crohn's disease (CD) ***(Schiller et al., 2017 and Arasaradnam et al., 2018)***.

In the present study, among the all the included non-neoplastic colonic biopsies, nonspecific colitis was found to be commonest lesion seen in 100 cases (40%). This finding is in agreement with, studies done by ***Abilash and Shreelakshmidevi (2018), Deshpande et al, (2010), Rajbhanderr et al., (2013), and Karve et al (2015).*** Additionally, a study published by ***Manpreet et al., 2018*** mentioned 56% of cases were diagnosed as non-specific colitis and followed by ulcerative colitis (20%). Similar findings were found by ***Danase et al., 2011*** respectively.

The following specific colonic lesions are variable as bacterial colitis in 13 cases, ulcerative colitis (UC) in 60, crohn disease (CD) in 30, eosinophilic colitis in 4, collagenous colitis 2 and melanosis coli seen in 2 cases. In a study performed in India on 198 biopsies, ulcerative colitis diagnosed in 23 cases, whereas CD in 5 cases ***(Geetha et al, 2018)***. This observation may be explaining a geographical and racial discrepancies in relation to inflammatory bowel disease. Solitary rectal ulcer found in 5 cases (2%) among all studied biopsies, whereas majority of polyps seen are hyperplastic and detected in 15 cases (6%), hamartomatous polyps including both Petuz-Jehejers and juvenile all are seen in 8 cases (3.2%).

The colon is site of growth and multiplications of various pathologies, an inflammatory cellular reactions evolved by them a predominant neutrophil-inflammation is linked to bacterial colitis in association with harboring of bacterial colonies, whereas an eosinophilic predominant inflammation is commonly related to parasitic infestations as well as eosinophilic colitis ***(Huang, Appleton 2016, Patel, Voltaggio 2011 & Fisher, Halalau 2018)***.

Solitary rectal ulcer syndrome is commonly observed in younger patients and typically presenting with diarrhoea and rectal bleeding ***(Geboes, Lauwers, 2010)***. Solitary rectal ulcer is associated with thickening of the bowel mucosa with laying down of muscle fibers and fibrosis in the lamina propria. In addition to the above, the crypts are elongated, dilated and hyperplastic and become 'pinched' at the base, resulting in a characteristic diamond-shaped rather than circular profile ***(Warren 1990)***. The surface may demonstrate erosion and fibrin formation, reminiscent of a pseudomembrane ***(Saul, Sollenberger 1985)***. Alternatively, lesions which presumably have been traumatised may demonstrate neutrophil-predominant inflammation, and there is the potential for confusion with IBD and ischemia ***(Zhu et al., 2014)***.

Eosinophilic colitis is carrying a wide range of differential diagnoses and in children is linked to atopy and allergy is the most common cause of eosinophil-predominant inflammation in the colon. Parasitic cause is considering one of the common etiology, especially in patients who are immunosuppressed ***(Yan and Shaffer 2009, Cacopardo et al., 1997 & Al Samman et al., 1999)***.

CONCLUSION

This study can summarize that colon is one of serious body organs and involved by various pathologies that can range from trivial inflammations to catastrophic one as Ulcerative colitis and Crohn disease which require serious therapeutic interventions. So, accurate diagnosis through continuing endoscopy, biopsy and histopathology is imperative to reduce patient morbidity and mortality.

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Nil.

2- Conflicts of interest
Authors declare no conflict of interest.

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