

Nature of Colon Biopsies after Colonoscopy among the Population in Al Kharj City: A Retrospective Study

Ali Hassan A. Ali¹, Wafaey Badawy², Abdulaziz Abdulelah Alotaibi³, Hassan Fahad Bin Daaj³, Rayan Ghannam A. Al Ghannam³, Abdullah Abdulrahman Almahmoud³, Mohammad Nasser A. Aldawsari³, Omar Khalid A. Alzahrani³, Yousef Alrwais³, Fahad M. Akash Anazi³, Fahad Abdullah Alquraini³, Ahmed Sameer Dwary³, Naif Saud Alshetaly³, Talal Hani Abdullah Arab³, Nouf Abdulaziz A. Alhuzani³

¹Department of Basic Medical Science, College of Medicine, Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia, ²Department of Pathology, Military Industries Hospital, Al-Kharj, Saudi Arabia, ³College of Medicine, Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia

Abstract

Background: The gold standard for identifying lower gastrointestinal problems is still colonoscopy combined with histological investigation of mucosal biopsy samples. **Aim of Study:** This study's goal was to identify the histology results' pattern from mucosal samples taken during colonoscopies during the previous year among Al Kharj City residents. **Materials and Methods:** This was a retrospective study. Age, gender, colonoscopy diagnosis, and histological diagnosis were obtained for analysis from the histopathology department's June 2025 and May 2026 reports. A statistical study was carried out. **Results:** A total of 250 patients' data were examined: 107 girls (42.8%) and 143 men (57.2%). The cases ranged in age from 20 to 70 years and older. The majority of participants were patients between the ages of 50 and 59. The most prevalent histologic abnormality among the study participants was tubular adenoma (67, 26.8%), which was followed by hyperplastic polyps (33, 13.2%), adenocarcinoma (24, 9.6%), chronic inflammation (19, 7.6%), and chronic active colitis (17, 6.8%). **Conclusion:** For the early diagnosis of pre-malignant lesions, screening colonoscopy should be advised for everyone 45 years of age or older. Therefore, histopathology is essential for the diagnosis of both neoplastic and non-neoplastic lesions.

Key words: Al Kharj, colon biopsy, colonoscopy, histopathology, retrospective

INTRODUCTION

The process of seeing the mucosa of the whole colon and terminal ileum in order to identify intestinal abnormalities and collect a biopsy for a conclusive diagnosis is known as colonoscopy.

Many neoplasms have the colon as their primary host. Infectious, idiopathic, and inflammatory polyps, motility issues, and colorectal cancers are among the several types of colonic lesions. For a definitive diagnosis, colonoscopic biopsies are frequently necessary for all of these conditions.^[1] Symptoms such as diarrhea, constipation, hematochezia, and changes in bowel habits are signs of major intestine pathology and call for a colonoscopy.^[2] Colonoscopy is a direct endoscopic view of the

terminal ileum's mucosa and the entire large bowel, with the added benefit of the ability to remove lesions such as polyps for histological analysis or perform a mucosa biopsy of lesions found.^[3] The mucosal lesions might be localized or broad, patchy or diffuse, and manifest as masses, polyps, erosions, ulcers, diverticulum, or hyperemia.^[4] Four primary categories, mucosal architecture, lamina propria cellularity, inflammatory cell infiltration, and epithelial abnormalities, are used to separate the various colon diseases for diagnosis.

Address for correspondence:

Ali Hassan A. Ali, Department of Basic Medical Science, College of Medicine, Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia.
E-mail: alihassan3750@yahoo.com

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Suspected colorectal cancer, unexplained weight loss, unexplained anemia and a positive fecal occult blood test are additional indications for a colonoscopy.^[5] However, the gold standard method for identifying lower gastrointestinal problems is still colonoscopy with mucosal biopsy. Adenomas are thought to be the cause of around 95% of all colorectal carcinomas, and pre-existing polyps constitute a significant risk factor for the subsequent development of colorectal malignancies. To confirm the diagnosis of a major intestinal pathology, histopathological analysis of biopsies collected during colonoscopy is required.

Confirmation of a diagnosis is essential in evidence-based medicine to implement the proper treatment plan for this condition.

This study assessed the histological results of large intestine mucosal biopsy samples taken during colonoscopies over the previous 2 years from Saudi patients who were submitted to the histopathology department at Al Kharj Military Industries Hospital for histological analysis.

MATERIALS AND METHODS

This retrospective analysis used information from the medical records of all cases that had undergone biopsy samples taken during colonoscopies at the Department of Histopathology, The Military Industries Hospital, Al Kharj, Saudi Arabia, between June 2025 and May 2026. Age, gender, presenting condition, preliminary clinical diagnosis, colonoscopy assessment, and histological diagnosis were all taken from the reports. Before being transferred to the pathology laboratory for histological examination, the specimens were promptly kept in sterile glasses with 10% formaldehyde. However, it is a common discovery in the West, and this is due to a variety of factors. It was then colored with hematoxylin-eosin and inspected under a microscope. The examinations were carried out by pathologists from the pathology department in conformance with the requirements. The quantitative data collected for this study were analyzed using measures of central trends and frequencies. The information was gathered using a Microsoft Excel spreadsheet. Frequency tables with percentages, charts, averages, and standard deviations were among the descriptive statistics employed. Statistical significance was defined as $P < 0.05$. This research was conducted in compliance with the Declaration of Helsinki's ethical criteria; informed consent was neither necessary nor acquired, and the subjects' identities were kept confidential.

RESULTS

Medical data of 250 patients who underwent colonoscopy were revised for this research. Of them, 143 (57.2%) were males, and 107 (42.8%) were females. The age range of the patients was 20 to more than 70. 77 patients (30.8%) were

between the ages of 50 and 59. Therefore, those in the 20–29 age group (5.2%) were the smallest, whereas those in the latter group were the largest. For this research, data between June 2025 and May 2026 were collected [Table 1].

According to the location of the lesion as determined by colonoscopy, polyps from various regions of the colon accounted for 50 cases (20%) and the transverse colon for 40 instances (16%).

The splenic or left colic flexure was only been biopsied in two cases, making it the least affected lesion [Table 1].

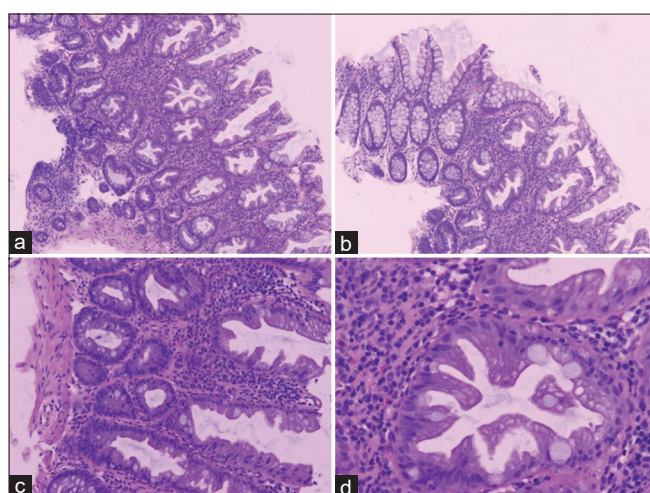
Table 2 demonstrates the histopathological diagnoses of different cases. The most frequent diagnosis, tubular adenoma, was found in 67 cases (26.8%). Under a microscope, tubular adenomas are distinguished by a particular structure that resembles branching tubelike glands. Dysplastic epithelium made up of hyperchromatic, elongated nuclei organized in a pseudo-stratified pattern covered the intestinal mucosa. Usually, low-grade dysplasia can sometimes be high-grade, with cytologic (vesicular chromatin, nucleoli, and loss of basal polarity) and architectural (cribriform and luminal necrosis) abnormalities [Figure 1]. In particular cases, tubular adenomas with low-grade dysplasia are discovered; this indicates that the cells exhibit mild or early alterations. When the lesion is totally eliminated, the chance of malignancy is extremely minimal [Figure 2]. In specific cases of high-grade or focal high-grade dysplasia, a region of the lesion exhibits more advanced pre-cancerous

Table 1: Distribution of cases according to age, gender, and location of the lesion by colonoscopy ($n=250$)

Parameter	Category	<i>n</i>	Percentage
Gender	Male	143	57.2
	Female	107	42.8
Age	20–29	13	5.2
	30–39	36	25.2
	40–49	58	23.2
	50–59	77	30.8
	60–69	45	18
	Above 70	21	8.4
Location of the lesion by colonoscopy	Splenic flexure	2	0.8
	Colon polyp	50	20
	Cecum	32	12.8
	Transverse colon	40	9.6
	Ascending colon	24	16
	Descending colon	16	6.4
	Rectum	50	12
	Sigmoid colon	30	20
	Recto-sigmoid	6	2.4

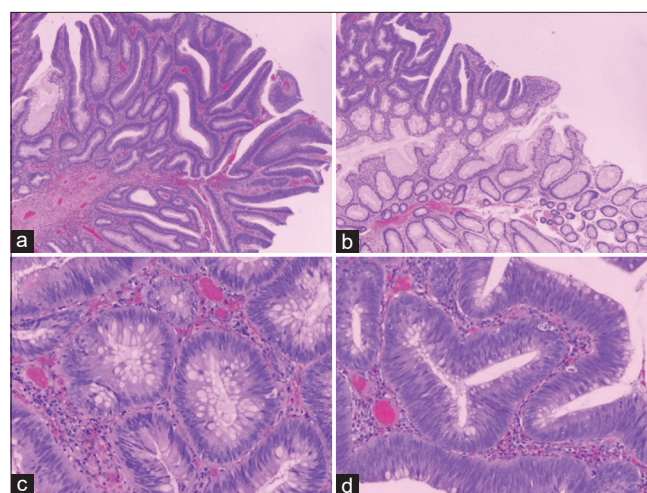
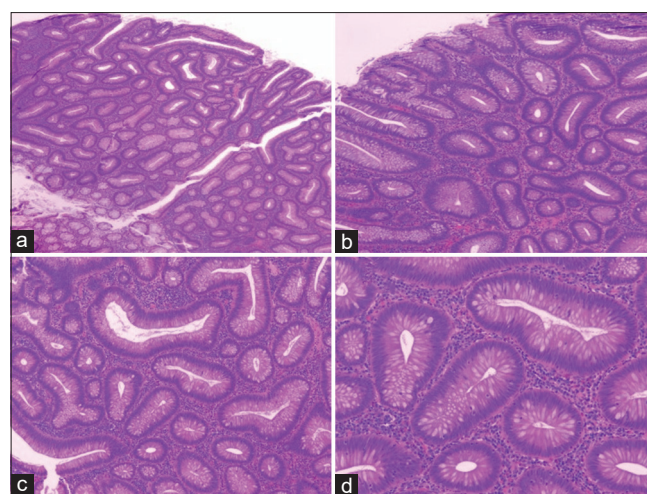
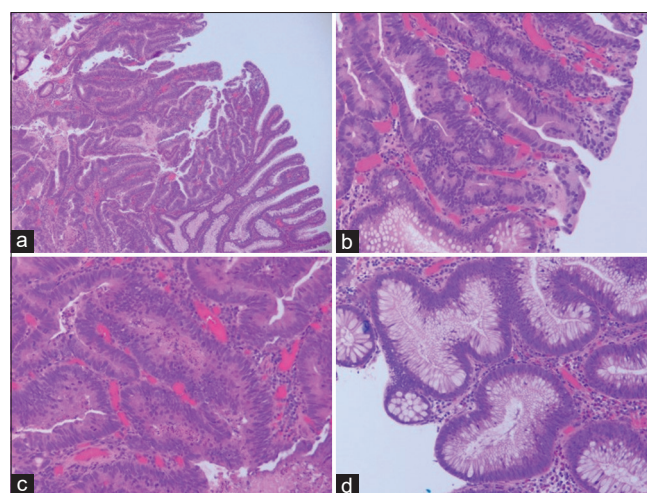
Table 2: Variety of different cases' histology diagnoses ($n=250$)

Diagnosis	<i>n</i>	Percentage
Tubular adenoma	67	26.8
Hyperplastic polyps	33	13.2
Ulcerative colitis	8	3.2
Solitary rectal ulcer with polyp	26	10.4
Adenocarcinoma	24	9.6
Chronic inflammation	19	7.6
Tubulovillous adenoma	4	1.6
Early tubular adenoma	7	2.8
Paucicellular microscopic colitis	6	2.4
Microscopic colitis	14	5.6
Hyperplastic changes and granular tissue formation	7	2.8
Chronic active colitis	17	6.8
Intramucosal carcinoma	5	2
Mild active chronic inflammation	13	5.2

**Figure 1:** Different images of serrated adenoma stained with hematoxylin and eosin (a and b $\times 200$), (c and d $\times 400$)

alteration, but it is not malignancy. The chance of the polyp developing into cancer is eliminated by complete excision [Figure 3].

Twenty-four cases (9.6%) had invasive moderately differentiated adenocarcinoma. The type of colon cancer that is most common. It began in the inner lining gland cells of the colon and progressed to the deeper layers of the colon wall. It is highly treatable, and under a microscope, the cells form recognizable but slightly abnormal gland structures. It was identified by the appearance of glands that were frequently cribriform and packed with necrotic material. In addition, dispersed neuroendocrine cells and inflammatory cells were prevalent [Figure 4].

**Figure 2:** Different images of tubular adenoma with high grade dysplasia stained with hematoxylin and eosin (a and b $\times 200$), (c and d $\times 400$)**Figure 3:** Different images of tubular adenoma with low-grade dysplasia (a, $\times 100$, b $\times 200$, c $\times 300$, d $\times 400$)**Figure 4:** Different images of tubulovillous adenoma with intramucosal carcinoma (a, $\times 100$, b $\times 300$, c and d $\times 400$)

Intramucosal carcinoma was found in 5 cases (2%). This kind of malignancy is identified by glandular growth that extends no farther than the muscularis mucosae and has high-grade nuclei and architectural complexity. Thus, there were 29 cases (11.6%) of malignancy overall.

DISCUSSION

Colonoscopy with mucosal biopsy samples for histopathological investigation is the gold standard diagnostic technique for evaluating and verifying large bowel illnesses.^[6] The histological results of mucosal biopsy samples taken from colonoscopies during the past year in Al Kharj city were evaluated retrospectively in this study. This was a clinicopathological review since it also includes the subjects' diagnoses and these histological findings. When compared to comparable studies conducted in other countries of the world, the total number of histopathological analyses conducted on mucosal biopsies collected from colonoscopy over the preceding 12 months under evaluation is very low.^[7-9] There were more men than women in this study, and this gender distribution trend is consistent with findings from earlier studies of a similar nature. The most frequent histological finding in the current study was tubular adenoma (26.8%). In another study, the most frequent colonoscopy finding was colorectal cancer. It is prevalent in older people, as our study sample demonstrates.^[10] The second most frequent histology result in this study was a solitary rectal ulcer with polyps. The second most frequent histology finding in a number of other studies was chronic non-specific colitis.^[10-12] In this study, ulcerative colitis, an inflammatory bowel disease, was known to be rare; only eight cases have been documented in Al Kharj. However, it is a common discovery in the West, and this is due to a variety of factors.^[13] When evaluating patients with symptoms of the lower gastrointestinal tract that cannot be explained, histopathological analysis of mucosa specimens taken during colonoscopy is still a very helpful, economical, and quick diagnostic technique. The diagnostic utility of histology can be increased with proper specimen collection and processing, and a sound clinicopathological interpretation. The purpose of this study was to ascertain the histological outcomes of individuals who underwent a colonoscopy and mucosal biopsy due to lower gastrointestinal discomfort. The results of this study have given us much-needed information on our patients, which will have a significant impact on how these patients and, consequently, similar patients in Al Kharj city are evaluated and managed.

CONCLUSION

It is impossible to overstate the significance of histological examination of mucosal materials from colonoscopies in the assessment of patients with lower gastrointestinal symptoms. It is the gold standard test that is advised, and it ought to

be included in the regular diagnostic process for these individuals.

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AVAILABILITY OF DATA AND MATERIALS

The data are available upon request from the authors.

ETHICS APPROVAL

All series of steps that were implemented in this study complied with the Ethics Committee of Prince Sattam bin Abdulaziz University Institutional Review Board.

CONFLICT OF INTEREST

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

REFERENCES

1. Singh H, Turner D, Xue L, Targownik LE, Bernstein CN. Risk of developing colorectal cancer following a negative colonoscopy examination: Evidence for a 10-year interval between colonoscopies. *JAMA* 2006;295:2366-73.
2. Akere A, Oke TO, Otegbayo JA. Colonoscopy at a tertiary healthcare facility in Southwest Nigeria: Spectrum of indications and colonic abnormalities. *Ann Afr Med* 2016;15:109-13.
3. Cappell MS, Friedel D. The role of sigmoidoscopy and colonoscopy in the diagnosis and management of lower gastrointestinal disorders: Endoscopic findings, therapy, and complications. *Med Clin North Am* 2002;86:1253-88.
4. Yanık S, Akkoca AN, Özdemir ZT, Sözütek D, Yılmaz EE, Sayar S. Evaluation of results of lower gastrointestinal endoscopic biopsy. *Int J Clin Exp Med* 2014;7:5820-5.
5. Rex DK, Boland CR, Dominitz JA, Giardiello FM,

- Johnson DA, Kaltenbach T, *et al.* Colorectal cancer screening: Recommendations for physicians and patients from the U.S. Multi-society task force on colorectal cancer. *Gastrointest Endosc* 2017;86:18-33.
6. Doubeni CA, Corley DA, Quinn VP, Jensen CD, Zuber AG, Goodman M, *et al.* Effectiveness of screening colonoscopy in reducing the risk of death from right and left colon cancer: A large community-based study. *Gut* 2018;67:291-8.
7. Oguntoye OO, Oguntoye OA, Adeniyi OM, Jegede OS. Histopathological outcome of colonoscopic biopsies in a tertiary hospital in Southwestern Nigeria: A 7-year retrospective study. *Ann Afr Med* 2024;23:213-21.
8. Umana IO, Obaseki DE, Ekanem VJ. The clinicopathological features of lower gastrointestinal tract endoscopic biopsies in Benin City, Nigeria. *Saudi Surg J* 2017;5:9-20.
9. Dakubo J, Kumoji R, Naaeder S, Clegg-Lamptey J. Endoscopic evaluation of the colorectum in patients presenting with haematochezia at korle-bu teaching hospital accra. *Ghana Med J* 2008;42:33-7.
10. Kiros YK, Tsegay B, Abreha H. Endoscopic and histopathological correlation of gastrointestinal diseases in Ayder referral hospital, Mekelle university, Northern Ethiopia. *Ethiop Med J* 2017;55.
11. Gudissa FG, Alemu B, Gebremedhin S, Gudina EK, Desalegn H. Colonoscopy at a tertiary teaching hospital in Ethiopia: A five-year retrospective review. *PAMJ Clin Med* 2021;5:37.
12. Kidwai R, Sharma A. Correlation between clinical symptoms of various colorectal diseases and colonoscopic findings. *J Nepalgunj Med Coll* 2019;17:16-9.
13. Loftus EV Jr. Clinical epidemiology of inflammatory bowel disease: Incidence, prevalence, and environmental influences. *Gastroenterology* 2004;126:1504-17.

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