The Prevalence and Histopathological Types of Colonic Polyps **Removed during Colonoscopy in Tertiary Hospital Center: A** four-year Retrospective Study

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Abstract

Background: Colonic polyps can be classified endoscopically as sessile (flat lesion) and pedunculated (a lesion with a stalk); however, the most important classification for treatment and prognosis is the histopathological one which divides polyps into adenomatous, serrated, juvenile/ retention, inflammatory, mucosal, and hamartomatous polyps. Objective: The aim of this study is to detect the prevalence and types of colonic polyps removed during colonoscopic examination with their clinicopathological characteristics. Methods: A cross-sectional retrospective study was performed to analyze the histopathological reports of 6364 colonoscopic biopsies received in the Pathology Laboratory at the Gastroenterology and Hepatology Teaching Hospital, Medical City/Baghdad/Iraq from January 1, 2020, to December 31, 2023. Results: The prevalence of colonic polyps detected during colonoscopies was 15.79% (1005/6364) which included 600 males and 405 females with mean age of 46.22 ± 19.002 . The most common type was adenomatous polyp (49.9%). Other types are as follows: serrated polyp 20%, juvenile/ retention polyp 13.7%, inflammatory polyp 11.3%, mucosal polyp 1.8%, hamartomatous polyp 1.8%, and others 1.5%. Conclusion: Colonic polyps are a common finding in patients undergoing colonoscopy. The most common type is adenomatous polyps (premalignant lesions). This type is common in the elderly men and is often large in size.

Keywords: Colonic polyps, colonoscopy, histopathological types, prevalence

NTRODUCTION

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In general, the term polyp refers to any lump located not only within a hollow viscous mainly in the gastrointestinal tract but also within the respiratory and genitourinary tracts. These lumps are mainly mucosal in origin; however, some submucosal lesions may appear clinically as polyps.^[1] The majority of colonic polyps is sporadic, is common in males, and predominates in those over 50 years; in contrast, syndromic polyps are less common (<10% of the polyps), affect the pediatric or young individuals, and carry a high risk of malignant transformation. Some syndromes impart a 100% risk of developing colonic cancer such as familial adenomatous polyposis; others have 40%-70% risk of progression to colonic cancer such as Peutz-Jeghers syndromes, whereas Cowden syndrome (CS) carries a lower risk (<15%).^[2] Some environmental factors increase the risk of having colonic polyps such as smoking, alcohol consumption, and obesity (these factors also increase the risk of colonic cancer), others have a

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DOI: 10.4103/IRJCM.IRJCM 44 24 protective role exemplified by dietary fibers and nonsteroidal anti-inflammatory drugs.^[3]

Colonic polyps can be classified endoscopically as sessile (flat lesion) and pedunculated (a lesion with a stalk); however, the most important classification for treatment and prognosis is the histopathological one which divides polyps into adenomatous, serrated, juvenile/retention, inflammatory, mucosal, and hamartomatous polyps. These polyps are epithelial in origin (arise from the cells forming the mucosa of

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the colon), other less common polyps arise from submucosal mesenchymal cells such as leiomyoma and lipoma.^[1]

Adenomatous polyps are the most common colonic polyps removed during colonoscopy. Their prevalence increases with age with an estimated prevalence of 20%-60% according to autopsy and colonoscopic studies.^[4] Microscopically, these polyps are characterized by increased glandular proliferation lined by elongated hyperchromatic cells (low-grade dysplasia); when the lining cells lose their polarity and their nuclei become rounded and vesicular, a diagnosis of high-grade dysplasia ensues.^[2] Architecturally, three types are recognized: tubular, tubulovillous, and villous. Molecularly, most small sporadic adenomas do not have mutations; in contrast to advanced adenomas (large ones >1 cm or those with high-grade dysplasia) have mutations that are similar to those found in colorectal cancer such as chromosomal instability or microsatellite instability; this explains the adenoma-carcinoma sequence of tumorigenesis.^[2]

Serrated polyps are the second-most common colonic polyps with an estimated prevalence of 30%.^[5] These polyps are not a single entity but include hyperplastic polyp, sessile serrated lesion (SSL), and traditional serrated adenoma (TSA).^[6] Microscopically, hyperplastic polyps show serrated architecture with a sawtooth appearance, with serrations generally limited to the upper half of the crypts, whereas SSLs additionally have a lateral spread of the crypt bases (boot-shaped or anchor-shaped crypts). TSAs have a villiform growth pattern, pseudostratified eosinophilic columnar cells, and ectopic crypt foci. Molecularly, these polyps show mutually exclusive mutations of *KRAS or BRAF* associated with a CpG island methylator phenotype.^[2]

Juvenile/retention polyps commonly occur in childhood; however, one-third of them are present in adults. Most are sporadic; hereditary syndrome is suspected when there is a family history or more than 5 juvenile polyps present.^[7] Microscopically, these polyps are characterized by an edematous lamina propria with inflammatory cells and cystically dilated glands filled with mucus. *KRAS* mutations present in sporadic juvenile polyps, whereas juvenile polyposis syndrome is associated with *SMAD4 and BMPR1A* mutations in 60% of the cases. Other syndromes associated with juvenile polyposis are CS and its variant Bannayan–Riley–Ruvalcaba syndromes.^[2]

Inflammatory polyps are common in patient with inflammatory bowel disease, particularly ulcerative colitis. Other predisposing conditions include infectious colitis and ischemic colitis. They are not true polyps caused by epithelial proliferation but caused by inflammation, granulation tissue with adjacent mucosal glands loss; therefore, some clinicians called them "inflammatory pseudopolyps." Microscopically, these polyps often consist of normal colonic mucosa in a polypoid configuration, with increased inflammation.^[1] Colonoscopy was and still is the gold standard method for detection and managing colorectal polyps, particularly adenomatous and serrated polyps as a preventive measure to decrease the incidence of colorectal cancer globally. Once a polyp is resected during colonoscopy; the type, the size, the number of the polyps, and the degree of dysplasia present will dictate the time interval during which surveillance colonoscopy is done; for example, a single colonic adenomatous polyp <10 mm dictate the next colonoscopy be done within 7-10-year interval, while the guidelines recommend a 1-year surveillance if the number of colonic adenomas is more than ten.^[4] Currently, the Food and Drug Administration approved the use of artificial intelligence for computer-assisted polyp detection as a randomized clinical trial in 2021 showed an improved adenoma detection rate by 4% when using artificial intelligence during colonoscopy.[8]

The aim of this study is to assess the prevalence and types of colonic polyps removed during colonoscopic examination along with their clinicopathological characteristics.

METHODS

A cross-sectional retrospective study was done by analyzing the histopathological reports of 6364 colonoscopic biopsies received in the Pathology Laboratory at the Gastroenterology and Hepatology Teaching Hospital, Medical City/Baghdad/ Iraq between January 1, 2020, and December 31, 2023. The study included 1005 polyps removed during colonoscopy from 600 males and 405 females, with age groups range from 3 to 95 years old.

All patients diagnosed with colorectal polyps at this hospital were included in the study. The following parameters in the histopathological reports were studied: age and gender of the patient, the site, the size, and the type of the polyp. Patients diagnosed and underwent colonic polypectomy outside the hospital were excluded from the study, in addition to those patients underwent colonic resections. Any patient with more than one colonic polyp type was excluded from the study as they will affect the statistical analysis and there were 24 patients.

Statistical analysis

Data were introduced into Microsoft Excel sheet 2019 and loaded into SPSS (Statistical Package for the Social Sciences) version (24), IBM (International Business Machines Corporation Armonk, New York , Westchester County). Parametric data were presented as mean and standard deviation. Categorical data were presented as numbers and percentages. The Chi-square test and Fisher's exact test were used to analyze qualitative data, and P < 0.05 was considered discrimination of significance.

Ethical Approval

Ethical approval for this study was provided by the Scientific Unit Medical Ethics Committee of Al-Kindy College of Medicine, Baghdad, Iraq on 23rd October 2024.

RESULTS

Total

Our study includes 1005 colonic polyps diagnosed from 6364 colonoscopies done at the gastroenterology and hepatology teaching hospital with a polyp detection rate (15.79%) which obtained from the number of endoscopy where one polyp identified during procedure/total number of colonoscopy performed by the gastroenterologist. This percentage represents the prevalence of colonic polyps in patients underwent colonoscopy. The patients were divided into 600 males and 405 females with the mean age of 46.22 ± 19.002 [Table 1].

Regarding the sites of the polyps, 55.5% of them were removed from the colon as the endoscopist labeled them which include

| Table 1: | The | demographic | characteristics | Of | the | study |
|----------|-----|-------------|-----------------|----|-----|-------|
| sample | | | | | | |

| | n (%) |
|--|---------------------|
| Age groups (years) | |
| <18 | 108 (10.7) |
| 18–30 | 108 (10.7) |
| 31–40 | 135 (13.4) |
| 41–50 | 195 (19.4) |
| 51-60 | 228 (22.7) |
| 61–70 | 162 (16.1) |
| >70 | 69 (6.9) |
| Total | 1005 (100.0) |
| Sex | |
| Male | 600 (59.7) |
| Female | 405 (40.3) |
| Total | 1005 (100.0) |
| Age (years), mean±SD (minimum-maximum) | 46.22±19.002 (3-95) |
| SD: Standard deviation | |

| Table 2: The site of the polyps | | | | | |
|---------------------------------|------------|--|--|--|--|
| Site | Count (%) | | | | |
| Colonic | 558 (55.5) | | | | |
| Rectal | 294 (29.3) | | | | |
| Sigmoid | 135 (13.4) | | | | |
| Ileal | 3 (0.3) | | | | |
| Cecal | 15 (1.5) | | | | |



Figure 1: The proportion of adenomatous polyps among the study sample

ascending, transverse, and descending colon; the next most common site was the rectum (29.3%) [Table 2]. The mean size of the polyps was 7.75 ± 6.721 mm with the smallest polyp removed was 2 mm and the largest one was 50 mm which was TSA in the sigmoid [Table 3].

The most common type of colonic polyps is adenomatous polyp (501 polyps, 49.9%) with 438 polyps (87.42%) having low-grade dysplasia and 63 polyps (12.58%) as high-grade dysplasia [Figure 1 and Table 4]. The second common type is the new entity serrated polyp 29%; the vast majority of them are hyperplastic polyps [Figure 2 and Table 4].

There were significant associations between the adenomatous polyps with the sex and age of the patients; with the site and the size of the polyps. The adenomatous polyps were more common in males (54.5%) than females. As the age increases, the percentage of adenomatous polyps increases reaching 66.7% in those above 60. Most adenomatous polyps were detected in the cecum (80%) and sigmoid 64.4%. Most large polyps (more than 10 mm) were adenomatous (63.3%) [Table 5].

Serrated polyps were significantly associated with the age of the patient and the size of the polyps. Serrated polyps increased in their prevalence as the age advanced reaching 26.1% in those over 70. About 25.1% of diminutive polyps (<5 mm) were serrated. In contrast, no significant association was found between this type of the polyp with the sex of the patient or the site of the polyp [Table 6].

DISCUSSION

1005 (100.0)

Polyp is a Greek word referring to "morbid lump." Clinically, it infers any protrusion inside a hollow viscus such as gastrointestinal or genitourinary tracts. However, these protrusions have different clinical significance according to their type whether neoplastic like adenomatous polyps or nonneoplastic like the inflammatory ones.^[11] Colonoscopy is the method of choice for detecting and treating colorectal polyps, subsequent follow-up of the patients with polyps, and early diagnosis of malignancy, thereby decreasing the incidence of colorectal cancer by 60%–70%.^[9]





| Table 3: The size of the polyps in | the study sample |
|------------------------------------|-------------------|
| Size (mm) | Count (%) |
| ≤5 | 549 (54.6) |
| 6–9 | 167 (16.6) |
| ≥10 | 289 (28.8) |
| Total | 1005 (100.0) |
| Mean±SD (minimum-maximum) | 7.75±6.721 (2-50) |
| SD: Standard deviation | |

Table 4: The histopathological type of the polyps of the study sample

| Туре | Count (%) |
|--------------------|--------------|
| Adenomatous* | 501 (49.9) |
| Serrated** | 201 (20.0) |
| Juvenile/retention | 138 (13.7) |
| Inflammatory | 114 (11.3) |
| Mucosal | 18 (1.8) |
| Hamartomatous | 18 (1.8) |
| Others*** | 15 (1.5) |
| Total | 1005 (100.0) |

*Adenomatous polyps (501) divided as 438 polyps with low-grade dysplasia and 63 polyps with high-grade dysplasia, **Serrated polyp (201) divided as the following: Hyperplastic polyp 195 (97.02%), TSA 4 (1.98%), and SSL 2 (1%), ***Others include 6 lipomas, 3 leiomyomas, 3 lymphoid polyps, and 3 DALM. DALM: Dysplasia-associated lesion/ mass, TSA: Traditional serrated adenoma, SSL: Sessile serrated lesion

Our study indicates that the prevalence of colonic polyps (polyp detection rate) is 15.79%, this result is comparable to the results of previous studies done in Iraq: 14.3% in Sulaimaniyah study by Ghalib *et al.*, 2023 and 16.7% in Baghdad study by Hussein and Akayashy 2023.^[10,11] In a Turkish study done within 5 years by Uçmak *et al.*, 2016, the prevalence of colonic polyps was 13.3% (470/3514).^[12] In contrast, Boroff *et al.*, 2013, found that the mean standard deviation of the detection rate of colonic polyps in Mayo Clinic, USA was 49%.^[13] This large difference may be due to the high standard screening program done in a tertiary center in USA, advanced technology in their instruments, and high prevalence of colonic polyps in western countries due to their lifestyle.

Colonic polyps were more common in males (59.7%) than females (40.3%) in the current study. This result is similar to that found by Ghalib *et al.*, 2023^[10] with 53.49% in males and 46.51% in females and that in an Iranian study done by Delavari *et al.*, 2014.^[14] The mean age of our patients was 46.22 ± 19.002 , this is close to Hussein and Akayashy, 2023^[11] study (48.1 ± 15.9); and in contrast to Ghalib *et al.*, 2023^[10], in which the mean age was older (52.0 ± 17.59) and in Liu *et al.*, 2005, study was (56.6 ± 10.7).^[15]

Approximately half of the polyps were removed from the colon without specifying them in the report, whether ascending, transverse, or descending. This is often related to the missed information in the endoscopic report. This result is comparable to Hussein and Akayashy, 2023^[11],

| | Total | Count (%) | | Р |
|--------------------|-------|-------------|----------------|---------|
| | | Adenomatous | Nonadenomatous | |
| Age groups (years) | | | | |
| <18 | 108 | 9 (8.3) | 99 (91.7) | < 0.001 |
| 18–30 | 108 | 30 (27.8) | 78 (72.2) | |
| 31-40 | 135 | 75 (55.6) | 60 (44.4) | |
| 41–50 | 195 | 111 (56.9) | 84 (43.1) | |
| 51-60 | 228 | 126 (55.3) | 102 (44.7) | |
| 61-70 | 162 | 108 (66.7) | 54 (33.3) | |
| >70 | 69 | 42 (60.9) | 27 (39.1) | |
| Sex | | | | |
| Male | 600 | 327 (54.5) | 273 (45.5) | < 0.001 |
| Female | 405 | 174 (43.0) | 231 (57.0) | |
| Site | | | | |
| Colonic | 558 | 294 (52.7) | 264 (47.3) | < 0.001 |
| Rectal | 294 | 108 (36.7) | 186 (63.3) | |
| Sigmoid | 135 | 87 (64.4) | 48 (35.6) | |
| Ileal | 3 | 0 | 3 (100.0) | |
| Cecal | 15 | 12 (80.0) | 3 (20.0) | |
| Size (mm) | | | | |
| ≤5 | 549 | 246 (44.8) | 303 (55.2) | < 0.001 |
| 6–9 | 167 | 72 (43.1) | 95 (56.9) | |
| ≥10 | 289 | 183 (63.3) | 106 (36.7) | |

Table 5: The association of the adenomatous polyps with

the age, sex, site, and size

Table 6: The association of the serrated polyps with the age, sex, site, and size

| | Total | Serrated, n (%) | Nonserrated, n (%) | Р |
|--------------------|-------|--------------------|-----------------------|---------|
| Age groups (years) | | | | |
| <18 | 108 | 3 (2.8) | 105 (97.2) | < 0.001 |
| 18–30 | 108 | 15 (13.9) | 93 (86.1) | |
| 31-40 | 135 | 27 (20.0) | 108 (80.0) | |
| 41–50 | 195 | 45 (23.1) | 150 (76.9) | |
| 51-60 | 228 | 54 (23.7) | 174 (76.3) | |
| 61–70 | 162 | 39 (24.1) | 123 (75.9) | |
| >70 | 69 | 18 (26.1) | 51 (73.9) | |
| Sex | | | | |
| Male | 600 | 114 (19.0) | 486 (81.0) | 0.335 |
| Female | 405 | 87 (21.5) | 318 (78.5) | |
| Site | | | | |
| Colonic | 558 | 123 (22.0) | 435 (78.0) | 0.353* |
| Rectal | 294 | 48 (16.3) | 246 (83.7) | |
| Sigmoid | 135 | 27 (20.0) | 108 (80.0) | |
| Ileal | 3 | 0 | 3 (100.0) | |
| Cecal | 15 | 3 (20.0) | 12 (80.0) | |
| Size (mm) | | | | |
| ≤5 | 549 | 138 (25.1) | 411 (74.9) | < 0.001 |
| 6–9 | 167 | 39 (23.4) | 128 (76.6) | |
| ≥10 | 289 | 24 (8.3) | 265 (91.7) | |

*Fisher's exact test was used

in which the most common site was the descending colon 41.1% and Liu *et al.*, 2005, 58.6% in the distal colon. In Ghalib *et al.*, $2023^{[10]}$ study, the most common site was the

rectum 27.65% similar to Al-Jameel *et al.*, $2020^{[16]}$ study in Karbala. In our study, most (71.2%) colonic polyps removed were <1 cm, similar to Hussein and Akayashy, $2023^{[11]}$ study (73.4%).

Adenomatous polyps are the most common type in this study, most of them are low grade. The same finding was confirmed in the previous studies.^[11,17,18] The term" serrated polyps" includes hyperplastic, SSL, and TSA. However, our study found most of them are hyperplastic which constitutes the second-most common in other studies in Iraq,^[10,11] reiterating our result.

This study found significant associations between the adenomatous polyps with the sex and age of the patients; similar results were found by Valian *et al.*, 2023 who found a significant association between adenoma detection rate and elderly male.^[19] In Harish, 2007 study, an association was found between colonic polyp with severe dysplasia (colonic adenomatous polyp, high grade) and their large size.^[20]

The current study found a significant association between serrated polyps and the age of the patient but not their sex. In Crockett *et al.*, 2022 study, no association was found between this type of the polyp and the age and sex of the patients.^[21] In addition, our study found an association between serrated polyps and the size of colonic polyps as two-thirds of them were diminutive (<5 mm). Unfortunately, no previous studies were found discussing this aspect of serrated polyps.

The first limitation of our study includes the involvement of a single tertiary center hospital which may not reflect the true prevalence of colonic polyps in our population, particularly there is no screening program for colonoscopy in Iraq to detect the true prevalence in asymptomatic people as well. In addition, approximately half of the histopathological reports (525/1005) included in the study do not contain the symptoms of the patients due to their absence in the request forms provided by the gastroenterologists; in the remaining reports (480), the most common symptom for undergoing colonoscopy was bleeding per rectum (35.62%, 171/480). Finally, the endoscopic reports do not specify the site of "colonic" polyp whether ascending, transverse, or descending colon.

CONCLUSION

Colonic polyps are a common finding in patients undergoing colonoscopy. The most common type is adenomatous polyps (premalignant lesions). This type is common in the elderly men and is often large in size.

Recommendation

There is a need for colonoscopic screening program in Iraq to detect and treat these lesions to reduce the incidence of colonic cancer, a common malignancy in Iraq. Additional larger national studies are needed to know the prevalence of colonic polyps in asymptomatic population to enroll them in screening program according to the guidelines and follow-up studies are required to know the polyp's progression rate to colonic cancer.

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Conflicts of interest

There are no conflicts of interest.

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