Endoscopic Description of Colonic Masses in Egyptian Patients Presenting to Gastrointestinal Endoscopy and Liver Unit Kasr Al-Ainy

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Abstract

Background: Colorectal Cancer (CRC) is the third most common cause of cancer in males and the second in females worldwide. CRC affects men and women of all racial and ethnic groups, and is most often found in those aged 50 years or older.

Colonoscopy is considered the gold standard test for detection of colorectal masses. Its major advantage is the ability to examine the whole colon with high sensitivity for cancer and all classes of precancerous lesions.

Aim of Study: The aim of the study is to evaluate the epidemiological and the endoscopic features of colorectal masses in Egyptian patients presented to “Kasr Al-Ainy” Endoscopy Unit.

Patients and Methods: This is a descriptive cross-sectional hospital-based study. Evaluation of 6153 patients who underwent planned colonoscopy in the period between March, 2017 and December, 2019 at Gastrointestinal Endoscopy and Liver Unit - Kasr Al-Ainy was done. A total of 459 patients diagnosed with colorectal masses and their parameters were analysed which included; the patient's demographic data, cause of referral and presenting symptoms, endoscopic features of the colonic mass lesions including number of lesions, anatomical location of the mass and the results of histopathological examination of the masses.

Results: Colorectal masses were detected in 459 patients (7% of all colonoscopies). Fifty three percent of the patients were males. The mean age ±SD was 53±7 years. Around 60% of the patients were in the age range from 50 to 70 years. While 25% of cancers occurred in patients aged 40 years old or less. The most frequent indications for colonoscopy were assessment of a mass detected by imaging (26.58%) and symptoms associated with blood loss (22.22%).

Seventy six percent of the masses were located in the left side of the colon. About 60% of the histopathology results were retrieved, of these results the most common result was adenocarcinoma (74.2%).

Conclusions: Colorectal masses are not uncommon diagnosis among Egyptian patients undergoing colonoscopic examination for different indications at Gastrointestinal Endoscopy and Liver Unit - Kasr Al-Ainy. The clinical features and the characters of colorectal masses in Egyptian patients are unique and different than reported in the West. Also, the prevalence of CRC is relatively high in patients under 40 years of age in comparison to the Western countries which necessitates raising awareness of CRC in younger age groups to speed evaluation and diagnosis of younger patients and potentially improve outcome.

Key Words: Endoscopy – Colonic masses.

Introduction

COLORECTAL Cancer (CRC) is the 10th commonest cancer in Egypt, with rates slightly higher in females than in males. It represents 6.5% of all malignant cases discovered in 2018 according to the WHO database. The American Cancer Society (ACS), the Center for Disease Control and Prevention (CDC), the National Cancer Institute (NCI), and the North American Association of Central Cancer Registries (NAACCR) confirmed a decline in incidence and mortality of CRC during the last decades. However, despite the decreasing rates observed in adults aged 50 and older, recent studies have reported an increase in the incidence of CRC diagnosis among young adults [1].

Death rates from CRC have declined progressively since the mid-1980s. This improvement in outcome can be attributed to the detection and the removal of colonic polyps, detection of CRC at an earlier stage, and more effective primary and adjuvant treatments [2].

Recently many studies aimed to report new trends in CRC behavior. Multiple studies have analyzed new changes in CRC characters regarding anatomical distribution, morphology and clinical presentation in different age groups. Additionally, other studies have aimed at analyzing epidemiological and clinical differences in right and left colon cancers.
Patients and Methods

Patient population:
A total of 459 patients diagnosed with colonic masses were registered in the (Gastrointestinal Endoscopy and Liver Unit - Kasr Al-Ainy) registration system in the period from March, 2017 to December, 2019. The data and the medical records of these patients were subsequently analyzed.

Demographic data and clinical aspects:
The demographic data including patient’s age at the time of presentation & gender were collected. Also, the cause of referral and presenting symptoms were classified as follows:
A- Symptoms associated with blood loss which includes bleeding per rectum and iron deficiency anemia.
B- Change in bowel habits which includes constipation, diarrhea and alternating bowel habits.
C- Assessment of a mass or a lesion detected previously by any imaging modality.
D- Peri-operative assessment of colonic mass which includes tattooing of a colonic mass and assessing the anatomical site of the mass prior to surgery.
E- Abdominal pain.
F- Weight loss.
G- Other causes like metastases of unknown origin and screening for colonic masses.

Regarding tumor factors data, the following criteria were taken into consideration:
A- Endoscopic features of the colonic mass lesions including number and anatomical location of the mass, as described by the endoscopist.
B- The results of the histopathological examination of the colorectal masses, retrieved from data documented in Pathology Department Kasr El-Ainy.
C- The right colon was defined as the portion including the caecum, ascending colon, hepatic flexure, and transverse colon. While the left colon was defined as the splenic flexure, the descending colon, sigmoid, and rectum.

Statistical analysis:
Patients’ data including demographic data, indication for colonoscopy and morphological characters of the tumor were statistically analyzed regarding differences between right side and left side masses. Data were coded and entered using the statistical package SPSS (Statistical Package for the Social Sciences) version 25. Data were summarized using mean, standard deviation, median, minimum and maximum in quantitative data and using frequency (count) and relative frequency (percentage) for categorical data. The $p$-value $<0.05$ was defined as statistically significant.

Results
This is a descriptive hospital based study that included 459 Egyptian candidates of both genders, of all age groups who were diagnosed with colonic masses out of 6153 patients presented to Gastrointestinal Endoscopy and Liver Unit - Kasr Al-Ainy for colonoscopic examinations during the period between March 2017 and December 2019. The profile of the enrolled patients is shown in (Table 1). They were mostly males ($n=243/459, 53.3\%$, $p=0.4$) with a mean age ± SD of 53±7. The number of patients in relation to age was subsequently analyzed; around 60% of patients were in the age range from 50 to 70 years old.

Table (1): Demographic data of the enrolled patients.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>No. subjects (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients (n=459)</td>
<td></td>
</tr>
<tr>
<td>Gender:</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>245 (53.3%)</td>
</tr>
<tr>
<td>Female</td>
<td>214 (46.7%)</td>
</tr>
<tr>
<td>$p$-value=0.4</td>
<td></td>
</tr>
<tr>
<td>Age (years):</td>
<td></td>
</tr>
<tr>
<td>Mean/SD</td>
<td>53±7</td>
</tr>
<tr>
<td>&lt;20</td>
<td>3 (0.6%)</td>
</tr>
<tr>
<td>21-30</td>
<td>48 (10.4%)</td>
</tr>
<tr>
<td>31-40</td>
<td>63 (13.8%)</td>
</tr>
<tr>
<td>41-50</td>
<td>80 (17.4%)</td>
</tr>
<tr>
<td>51-60</td>
<td>121 (26.4%)</td>
</tr>
<tr>
<td>61-70</td>
<td>99 (21.6%)</td>
</tr>
<tr>
<td>71-80</td>
<td>39 (8.5%)</td>
</tr>
<tr>
<td>&gt;80</td>
<td>6 (1.3%)</td>
</tr>
</tbody>
</table>

Analyzing the anatomical distribution of colonic masses (right sided lesions vs left sided lesions) according to age group revealed that the proportion of right sided lesions was relatively higher in patients 30 years old or younger (35.2%, $n=18/51$) in comparison to the proportion of right sided lesions in the other age groups. Also, in patients between 41-50 years of age, the proportion of right sided colon lesions was high (31.6%, $n=23/79$). On the other hand, the proportion of left sided lesions was higher in patients older than 50 years (77.8%, $n=206/265$) in comparison to the proportion of left sided lesions in the other age groups and it is also considered high in patients in the age group between 31-40 years (81.9%, $n=11/61$).
The clinical features of patients 40 years old or younger are shown in (Table 2). They were 114 patients and represented around 25% of the cases. The masses were mostly located in the left side of the colon (74%, \( p=0.002 \)). The percentage of female patients was higher than that of the male patients in this age group (51.8% vs. 48.2%), however this result was statistically insignificant (\( p=0.6 \)). The most frequent indications for colonoscopy were assessment of abdominal mass detected by imaging, blood loss symptoms/anemia and change in bowel habits (25.4%, 23.7% and 20.1% respectively). The most common pathological finding was moderately differentiated adenocarcinoma (63.7%).

Table (2): Clinical features of patients younger than 40 years.

<table>
<thead>
<tr>
<th>Location:</th>
<th>Number</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Right/left lesions</td>
<td>30/84</td>
<td>26.3/73.6</td>
</tr>
<tr>
<td>Gender:</td>
<td>55/59</td>
<td>48.2/51.8</td>
</tr>
<tr>
<td>Clinical presentation:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Assessment of a mass detected</td>
<td>29</td>
<td>25.40</td>
</tr>
<tr>
<td>imaging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blood loss/Anemia</td>
<td>27</td>
<td>23.70</td>
</tr>
<tr>
<td>Change in bowel habits</td>
<td>23</td>
<td>20.10</td>
</tr>
<tr>
<td>Peri-operative management</td>
<td>14</td>
<td>12.30</td>
</tr>
<tr>
<td>Weight loss</td>
<td>6</td>
<td>5.30</td>
</tr>
<tr>
<td>Abdominal pain</td>
<td>6</td>
<td>5.30</td>
</tr>
<tr>
<td>Screening</td>
<td>7</td>
<td>6.10</td>
</tr>
<tr>
<td>MUO</td>
<td>2</td>
<td>1.7</td>
</tr>
</tbody>
</table>

Pathology:
- Adenocarcinomas:
  - Well diff adenocarcinoma   1.8
  - Mod diff adenocarcinoma    63.7
  - Poorly diff adenocarcinoma 5.5
  - Signet ring adenocarcinoma 3.6
  - Mucinous adenocarcinoma     3.6
- Other causes of malignant masses:
  - Lymphoma                    1.8
  - Neuro endocrinal tumor      3.6
  - GIST                        0
  - Malignant melanoma          0
- Inflammatory masses:
  - Conclusive or unknown      10.9

MUO: Metastasis of Unknown Origin.
GIST: Gastrointestinal Stromal Tumor.

Discussion

Colonoscopy is considered the gold standard test for the detection of colorectal masses. Its major advantage is the ability to examine the whole colon with high sensitivity for colorectal masses and all classes of cancerous and precancerous lesions [8]. Colonic masses are classified into benign lesions which include polyps, inflammatory masses, infectious masses, mesenchymal lesions and extrinsic lesions, and malignant lesions which include adenocarcinoma, lymphoma, carcinoid tumors, Kaposi sarcoma, and mesenchymal malignant masses [4].

CRC is the third most common cancer in males and the second in females worldwide. It is the 10th commonest cancer in Egypt. It represents 6.5% of all malignant cases discovered in 2018 according to the GLOBOCAN database (WHO, 2018).

In our study, colorectal masses were detected in around 7% of all patients undergoing colonoscopy at Gastrointestinal Endoscopy and Liver Unit-Kasr Al-Ainy during the two years time period of the study. Similarly, the studies done in other Middle Eastern countries as Morocco and Sudan [5,6] reported a percentage ranging between 9-11%. While [7] reported an even higher incidence of 14%. On the other hand, Western countries report a much lower incidence. For example, CRC was detected in 2.1% of patients who underwent colonoscopy in the United Kingdom [8].

This current transition of CRC epidemiology and the increasing incidence of colorectal masses in most developing countries can be attributed to environmental factors, such as changes in lifestyle and diet [9]. Additionally, the difficulties in treatment options and accessibility in low-income and middle-income countries limit the primary prevention and the early detection of colorectal lesions which increases the burden of CRC and colorectal masses [10].

Regarding the demographic features in this study, the percentage of males to females was 53.3% vs. 46.7%. This male predominance was also seen in studies like [11-13] with a percentage of 59.7%, 57.4% and 61.5% respectively. Gender related differences in CRC risk can be related to genetic and epigenetic factors, socio-cultural differences as well as dietary habits as there are gender-associated differences in nutrient metabolism and dietary practices [14].

Moreover, it was found that hormonal factors are strongly related to CRC risk. A study done by [15] suggested that estrogen exposure is a protective factor against CRC, while the lack of estrogen in older women increased the risk of CRC.

Also, males seek medical consultation more than females since many females find colonoscopic examination painful and embarrassing [16]. On the contrary, [17] demonstrated a female predominance of 60% in his study that included 81 patients; he
explained his findings that women had more consistent physician relationships, more screening-knowledgeable and more capable of articulating views on screening.

The mean age of patients diagnosed with CRC in the current study was 53 years with 60% of the patients in the age range between 50-70 years, which goes along with the age range (50-53 years) that was reported in other Egyptian studies as [7,12,18]. On the other hand, Western countries reported a higher age range in patients diagnosed with CRC, as in the USA where CRC cases were more prevalent in patients older than 69 years of age even though the incidence rate is found to be declining in older age groups [19]. These findings are explainable by the fact that age is a major risk factor for sporadic CRC and this risk significantly increases as people get older. The incidence of CRC begins to increase significantly between the ages of 40 and 50, and age-specific incidence rates increase in each succeeding decade thereafter [20].

The most common indications for colonoscopy in this study were assessment of a mass detected by imaging, symptoms associated with blood loss, perioperative assessment of colonic mass and change in bowel habits (26.58%, 22.22%, 16.78% and 16.34% respectively). These findings are relatively similar to the data collected in a study conducted in Saudi Arabia by [12], who reported that the most commonly seen presentations in their series were colorectal mass detected previously by imaging, bleeding per rectum and clinical features of intestinal obstruction (43.6%, 29.1% and 26.43% respectively). On the other hand, studies as [7,21,22] reported rectal bleeding and blood loss symptoms as the most common presentations with a percentage of 36%, 57% and 40% respectively.

This finding can be possibly explained by the fact that this study was conducted in a tertiary care hospital and most of the patients were referred from in-patient departments or emergency room after undergoing primary workup which includes imaging and laboratory tests. Another potential explanation is that patients and physicians prefer the use of non-invasive diagnostic tools as imaging, being more available, of lower cost, easier preparation and more convenient to the patient [23].

Regarding the tumour factor data, the frequency of left sided lesions was significantly higher than that of the right sided lesions and the rectum was the most common site followed by the sigmoid colon. This goes along with the studies conducted by [22,24,25] where a significant predominance of left sided lesions was seen. Potential causes of left site predominance can be due to differences in lifestyle, and/or dietary habits, colonizing microbiota, as it was reported that microbiota colonies are different between the right and the left side of the colon [26], and genetic differences as Chromosomal Instability (CIN), which is associated with 60%-70% of CRC, is more often observed in left-sided colon cancer while Microsatellite Instability (MSI) is more often observed in right side lesions [14]. It is worth noting that the reported incidence of right sided lesions (23%) doesn't go along with the increasing incidence of right sided lesions reported in Western studies as [27] and studies like [7,24,28] which reported a relatively higher incidence of right sided lesions (around 32%). On the other hand, other studies like [29] reported no evidence of change in the anatomic distribution of CRC.

This can be attributed to the widespread use of screening programs in developed countries as the USA that has led to an overall CRC decline. This decline is more evident distally as the screening results for distal lesions are more sensitive for technical, anatomical and morphological reasons [30].

As regards the relation between the age of the patient and the anatomical location of the colonic masses, in the current study the proportion of right sided lesions was relatively higher in patients aged 30 years or younger (35.2%). This finding was also seen in studies like [31,32] as they reported a relatively high percentage of right sided colon cancer in younger age groups concluding that younger age was associated with an increasing proportion of right sided lesions. On the other hand, studies conducted by [27,33] observed that the incidence of right sided colon cancer increased gradually with age. While studies like [24,34] reported no significant difference while analysing age at diagnosis in relation to tumour anatomical distribution.

As regards the histopathological results of the masses in our study, we retrieved around 60% of the tissue results of the masses. We found that adenocarcinoma represented 74.2% of the cases with moderately differentiated adenocarcinoma seen in 60.7% of the cases. While inflammatory masses, solitary rectal ulcer and bilharzial polyp represented 4.2%, 0.8% and 0.8% respectively and about 13.4% of the masses were of inconclusive results. However, these findings were statistically insignificant (p-value=0.7). Studies as [7,12,18,35] reported relatively similar results with moderately
differentiated adenocarcinoma as the most common histopathological type.

Patients aged less than 40 years represented 25% of all diagnosed cases, which was also reported in the Egyptian study [7], while other Egyptian studies as [36] reported an even higher incidence in this age group (31.9%).

This high incidence was seen also in developing countries like India with an incidence of 33% [22], Iran with an average rate of 25% [37], Saudi Arabia with an incidence of 21% [38] and the Philippines with an incidence of 17% [39]. While in developed countries as the USA, 12% of the cases were diagnosed in patients aged 50 years or younger [19] and European Union like Italy and France, only about 2-8% of cases occur in individuals under 40 years of age [40,41]. This high rate of young-onset CRC is possibly adoption of a more "westernized" lifestyle, the change in diet habits or the change in the environmental exposures especially in the younger generation [42]. In the current study, the demographic data and the characters of colorectal masses in patients aged 40 years or younger followed the same pattern described in other age groups with the exception that the percentage of female patients was higher than that of the male patients in this particular age group. However, this finding was statistically insignificant, (p-value =0.6).

It is worth saying that the incidence of CRC among Egyptian patients is increasing and the epidemiological features of these patients and the characters of their colorectal masses are unique. Subsequently, the implementation of national strategy and recommendations need more detailed data collection which necessitates the need to develop a recording system that could document the epidemiological data of the patients and tumor factor data for better study and analysis of the disease.

References


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الوصف المناطقي لآورام القولون بالمريض المصري المتقدمين للفحص
بوحدة مناظير الجهاز الهضمي والكبد بالقصر العيني

يعد سرطان القولون أكثر الأورام إنتشاراً في الذكور عالمياً والثاني في الإناث، والأشخاص المعرضون للإصابة من السمنة أن يكونوا نكروا وإنثاء من مختلف الأعراق والأعمر. أثبتت الدراسات أن المرض أكثر إنتشاراً في المرضى أكبر (05 عاماً فيما فوق). بينما في
الآونة الأخيرة لوحظ زيادة معدل إنتشاره في الأفراد الأصغر سنأ.

يمثل سرطان القولون المركز العاشر في الأورام الأكبر إنتشاراً بمصر حسب إحصائيات منظمة الصحة العالمية وتعتبر الصفات الإكلينيكية والطبية المرضى المصابين بآورام القولون بمصر متقدمة وتحتاج إلى مزيد من البحث والدراسة.

يستخدم المناظر القولونى من أهم الفحوصات المستخدمة في تشخيص وعلاج الآورام القولونية نظراً لقدرته على فحص القولون بالكامل وحساسية عالية في اكتشاف الآورام القولونية الحادة والخبيثة.

بمجرد أن تمت هذه الدراسة هو التعرف على الصفات الدموية والخصائص الإكلينيكية والوصف المناطقي للآورام القولونية المرضى للمصريين المتقدمين للفحص بوحدة مناظير الجهاز الهضمي والكبد بالقصر العيني.

تمت مراجعة بيانات وتشخيص المناظر لـ953 مريض تم تشخيصهم بأورام القولونية من أصل 8600 مريض أُخذوا للفحص بالمناظر القولونية في الفترة بين مارس 2017 ومارس 2019. وكان قد تم إعداد تفاعل البيانات من برنامج التسجيل الإلكتروني الخاص بالمناظر بوحدة مناظير الجهاز الهضمي والكبد بالقصر العيني. كما تم إنتاج نتائج فحص الأنسجة الهيستوبوليوجي لهؤلاء المرضى في قسم الهيستوبوليوجي بالقصر العيني.

تمت دراسة البيانات الدموية والخصائص الإكلينيكية لـ995 مريض مصاب بآورام القولونية وآسباء تقدمهم للفحص ونتائج الفحص ملعقة الأورام وموقعها التشريحي ونتائج فحص الأنسجة الهيستوبوليوجي.

تتم تحليل تلك البيانات تم تشخيص 594 مريض يوجد رحم قولوني مما يمثل 4.4% من كل الحالات. مرت نسبة الرجال المصابين 50% بمتوسط أعمار 65 سنة وتم تزويج أعمار حوالي 10% من المرضى بين 50-70 عاماً بينما كان عمر 60% من المرضى أقل من 40 عاماً. كان أكثر أسباب الحاجة للفحص القولوني هو تقييم ورم قولوني سبب إكتشافه من طريق الأشعة التشخيصية. وأعراض نزيف الجهاز الهضمي أو أيهما.

ملاحظة: معظم الأورام توجد بجانب الأيسر من القولون بنسبة 76%. تم إنتاج حوالي 70% من نتائج فحص الهيستوبوليوجي من
قسم الهيستوبوليوجي بالقصر العيني. كان سرطان الخلايا الغذية هو الأكثر شيوعاً بنسبة 74%.

الاستنتاج: تم تشخيص الأورام القولونية بالمريض المصري المتقدمين بوحدة مناظير الجهاز الهضمي بالقصر العيني بنسبة
مليحية. وتعتبر الصفات الدموية والطبية لهؤلاء المرضى مخلطة عن الدول الغربية. كما لوحظ إرتفاع نسبة المصابين بالأورام القولونية ضمن الفئات العمرية الأصغر (أقل من 40 سنة) مما يستدعي القيام بالبحث增多 البحث عن الفحص أكثر علي خصائص الأورام القولونية بالمريض المصري ويزيادة التوعية الصحية وسرعة تشخيص الأورام القولونية في هذا السن لضمان نتائج صحية أفضل.