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Endoscopic Findings in Patients with Upper Gastrointestinal Bleeding at Benghazi Medical Center, Libya: A Retrospective Cross-Sectional Study

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ABSTRACT

Background: Upper gastrointestinal bleeding (UGIB) is a common and serious medical problem that may necessitate hospitalization and resuscitation. This study aimed to evaluate the endoscopic findings in patients presenting with UGIB in our population and their frequency among these patients according to gender and age.

Methods: This retrospective cross-sectional study was conducted at Benghazi Medical Center. Patients who underwent endoscopy for UGIB over a one-year period, from January to December 2023, were included. Patient data on age, gender, comorbidities and endoscopic findings were extracted from endoscopy reports and analyzed statistically.

Results: Among 243 patients who underwent endoscopy for UGIB, 50.2% were male, and the mean age was 53.60 ± 18.71 years. Patients aged > 60 years constituted the largest age group of the cohort (37.9%). The most common endoscopic finding was esophageal varices, accounting for 16.9% of cases. There was a statistically significant difference in the gender distribution of peptic ulcer disease, as a higher proportion of males than females presented with bleeding due to peptic ulcers (p = 0.002), especially duodenal ulcers. No endoscopic lesions were found in 13.2% of patients, with a statistically significant difference in the gender distribution of these patients, as a higher proportion was found in females than in males (p = 0.002).

Conclusions: Bleeding from esophageal varices was the most common cause of UGIB in this setting, whereas bleeding from peptic ulcer was relatively less common. The low peptic ulcer and high negative-endoscopy rates may reflect delayed endoscopy, highlighting the need for timely endoscopy.

النتائج التنظيرية لدى المرضى المصابين بنزيف الجهاز الهضمي العلوي في مركز بنغازي الطبي، ليبيا: دراسة مقطعية استعادية

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الكلمات المفتاحية:
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الملخص

الخلفية: يُعد نزيف الجهاز الهضمي العلوي مشكلة طبية شائعة وخطيرة قد تتطلب الدخول إلى المستشفى والإنعاش. هدفت هذه الدراسة إلى تقييم نتائج التنظير الداخلي لدى المرضى الذين يعانون من نزيف الجهاز الهضمي العلوي في مجتمعنا، ومدى تكرارها بين هؤلاء المرضى حسب الجنس والعمر.

الطرائق: أُجريت هذه الدراسة المقطعية الاستعادية في مركز بنغازي الطبي، وشملت المرضى الذين أجروا التنظير بسبب نزيف الجهاز الهضمي العلوي خلال سنة واحدة من يناير إلى ديسمبر 2023. واستُخرجت بيانات المرضى المتعلقة بالعمر والجنس والأمراض المصاحبة والنتائج التنظيرية من تقارير المناظير، وحُللت إحصائيًا.

النتائج: من بين 243 مريضًا أجروا تنظيرًا للجهاز الهضمي العلوي بسبب النزيف، كان 50.2% منهم من الذكور، وبلغ متوسط العمر 53.60 ± 18.71 سنة. وشكّل المرضى الذين تزيد أعمارهم على 60 عامًا الفئة العمرية الأكبر في الدراسة (

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37.9%). وكانت دوالي المريء أكثر النتائج التنظيرية شيوعًا بنسبة 16.9%. ووُجدت فروق ذات دلالة إحصائية في توزيع القرحة الهضمية بين الجنسين، إذ كانت نسبة الذكور الذين يعانون من نزيف بسبب القرحة الهضمية أعلى من الإناث ($p = 0.002$)، ولا سيما قرحة الاثني عشر. ولم يُعثر على آفات بالمنظار لدى 13.2% من المرضى، مع وجود فرق ذي دلالة إحصائية في توزيع هؤلاء المرضى حسب الجنس، إذ كانت النسبة أعلى لدى الإناث مقارنة بالذكور ($p = 0.002$).

الاستنتاجات: أظهرت الدراسة أن النزيف من دوالي المريء كان السبب الأكثر شيوعًا لنزيف الجهاز الهضمي العلوي في هذا المركز، وأن النزيف من القرحة الهضمية كان أقل شيوعًا نسبيًا. وقد تعكس المعدلات المنخفضة للقرحة الهضمية والمعدلات المرتفعة للنتائج السلبية في التنظير تأخرًا في إجراء التنظير، مما يؤكد الحاجة إلى التنظير في الوقت المناسب.

1. Introduction

Upper gastrointestinal bleeding (UGIB) is defined as any blood loss within the digestive tract lumen from the esophagus, stomach or duodenum proximal to the ligament of Treitz [1]. It is a common and serious medical problem that may necessitate hospitalization and resuscitation [2]. UGIB may be acute, chronic or occult (with no visible blood loss) [3]. Clinically, patients with acute UGIB frequently present with melena, hematemesis or coffee-ground vomiting, and hematochezia is occasionally seen in 5–10% of patients with a significant UGIB source [3,4].

Although the global incidence of UGIB has decreased in recent decades because of *Helicobacter pylori* (*H. pylori*) eradication and advances in the management of liver cirrhosis, acute UGIB still carries high morbidity and mortality worldwide [1,5]. The incidence of UGIB ranges from 15 to 172 cases per 100,000 individuals each year [6], and overall UGIB mortality is approximately 2–10% [7].

UGIB has multiple etiologies, which can be divided into two categories: variceal bleeding (from ruptured esophageal and gastric varices) and nonvariceal bleeding (from peptic ulcer disease and other disorders). This distinction affects prognosis, as patients with variceal bleeding are at higher risk of rebleeding and have a higher mortality rate than those with nonvariceal bleeding; the two categories also require different treatment methods [7,8]. The causes of UGIB and the proportion attributable to each cause differ by geographic location according to the demographic features and socioeconomic status of the population [9,10]. In 10–15% of patients with UGIB, the source of bleeding cannot be identified because the lesion is difficult to diagnose (e.g., Dieulafoy's lesion), is hidden by blood clot during endoscopy, or has healed by the time endoscopy is performed [11].

Esophagogastroduodenoscopy (EGD) is the diagnostic modality of choice for UGIB because it has high diagnostic accuracy, allows assessment of bleeding risk, and enables therapeutic intervention when indicated [4]. The most essential part of the management of gastrointestinal bleeding is identifying the bleeding site and cause and starting treatment as soon as possible [12,13]. Therefore, current guidance recommends that patients admitted to, or under observation in, hospital for UGIB undergo endoscopy within 24 hours of presentation after hemodynamic resuscitation for suspected nonvariceal bleeding, and within 12 hours for suspected variceal bleeding [14–16].

To the best of our knowledge, epidemiological data on the clinical and endoscopic profiles of patients with UGIB remain limited in Libya, particularly in the eastern region, despite the use of endoscopy as the standard method for the diagnosis and treatment of UGIB in most tertiary-level hospitals in the country. Hence, this study aimed to assess the endoscopic findings in patients presenting with UGIB in our population and their frequency according to gender and age.

2. Materials and Methods

2.1. Study design and setting

This retrospective cross-sectional study was conducted at the endoscopy unit of Benghazi Medical Center, a public hospital providing tertiary-level health care to the general population in Libya, over a one-year period from January to December 2023.

2.2. Study population and sampling

A total of 243 patients with UGIB who presented with hematemesis, melena or both were included in the study. Endoscopy reports were reviewed for age, gender and comorbidities (diabetes mellitus, hypertension, cardiac disease, stroke or liver cirrhosis), and the EGD findings were recorded together with the description of the lesions identified.

2.3. Eligibility criteria

Patients older than 15 years with complete data were included, whereas those with incomplete data and those undergoing repeat EGD for any reason were excluded.

2.4. Ethical approval

The study was approved by the research administration of the Libyan Board of Health Specialties (approval no. 52/194/2025, dated 2 April 2025).

2.5. Statistical analysis

Data were analyzed using IBM SPSS Statistics, version 23 (IBM Corp., Armonk, NY, USA). Continuous variables were described as mean ± standard deviation (SD) with minimum and maximum values, and categorical variables as frequencies and percentages. The chi-square test (or Fisher's exact test, where appropriate) was used to compare categorical variables, and the independent samples t-test was used to compare means between groups (e.g., age by gender). A p value < 0.05 was considered statistically significant.

3. Results

A total of 243 patients who underwent EGD for the evaluation of UGIB during 2023 were included in the study. Of these, 122 (50.2%) were male and 121 (49.8%) were female, giving a male-to-female ratio of almost 1:1. The mean age was 53.60 ± 18.71 years (54.49 ± 18.30 years in males and 52.70 ± 19.15 years in females), with no statistically significant difference in mean age between genders (t(240.31) = 0.745, $p = 0.457$). The youngest patient was 16 years old and the oldest was 94 years old (Table 1). The most common comorbidity was liver cirrhosis (n = 53, 21.8%), and the most common nonhepatic comorbidity was diabetes mellitus (n = 22, 9.1%), followed by cardiac disease (n = 21, 8.6%), hypertension (n = 14, 5.8%) and stroke (n = 11, 4.5%).

Table 1. Characteristics of patients presenting with upper gastrointestinal bleeding (n = 243)

Variable	Value
Age (years)	
Mean ± SD	53.60 ± 18.71
Range	16–94
Gender, n (%)	
Male	122 (50.2)
Female	121 (49.8)
Age group, n (%)	
≤ 40 years	64 (26.3)
41–60 years	87 (35.8)
> 60 years	92 (37.9)
Comorbidities, n (%)	
Diabetes mellitus	22 (9.1)
Hypertension	14 (5.8)
Cardiac disease	21 (8.6)
Previous stroke	11 (4.5)
Liver cirrhosis	53 (21.8)

SD, standard deviation.

Patients aged > 60 years were the most represented group in this cohort (n = 92, 37.9%), followed by those aged 41–60 years (n = 87, 35.8%), whereas those aged ≤ 40 years were the least represented (n = 64, 26.3%). There was no statistically significant difference in the gender distribution of the age groups ($p = 0.445$; Table 2).

Table 2. Gender distribution of age groups among patients with upper gastrointestinal bleeding

Age group (years)	Male, n (%)	Female, n (%)	Total, n (%)	*p* value
≤ 40	30 (24.6)	34 (28.1)	64 (26.3)	
41–60	41 (33.6)	46 (38.0)	87 (35.8)	
> 60	51 (41.8)	41 (33.9)	92 (37.9)	
Total	122 (100)	121 (100)	243 (100)	0.445

The most common endoscopic finding was esophageal varices (n = 41, 16.9%), followed by portal hypertensive gastropathy (PHG) and gastric erosions, each seen in 39 (16.0%) patients. These were followed, in decreasing order of frequency, by reflux esophagitis (n = 38, 15.6%), gastritis (n = 37, 15.2%), peptic ulcer disease (n = 34, 14.0%), duodenal erosions (n = 26, 10.7%), suspected mass lesions (n = 12, 4.9%), gastric varices (n = 9, 3.7%), duodenitis (n = 8, 3.3%) and other less common findings. Overall, a variceal source of bleeding, including esophageal and gastric varices, was found in 43 patients (17.7%). There was a statistically significant difference in the gender distribution of peptic ulcer disease, as a higher proportion of males than females presented with bleeding due to peptic ulcers (20.5% vs. 6.6%, $p = 0.002$), especially duodenal ulcers (15.6% vs. 5.0%, $p = 0.010$). The other findings showed no statistically significant difference in gender distribution. No endoscopic lesions were found in 32 (13.2%) patients, and normal endoscopy was significantly more frequent in females than in males (19.8% vs. 6.6%, $p = 0.002$; Table 3).

Table 3. Distribution of endoscopic findings by gender

Endoscopic finding	Male, n (%)	Female, n (%)	Total, n (%)	*p* value
Peptic ulcer				
Gastric ulcer	7 (5.7)	2 (1.7)	9 (3.7)	0.172
Duodenal ulcer	19 (15.6)	6 (5.0)	25 (10.3)	**0.010**
Total	25 (20.5)	8 (6.6)	33 (13.6)	**0.002**
Variceal source				
Esophageal varices	17 (13.9)	24 (19.8)	41 (16.9)	0.235
Gastric varices	4 (3.3)	5 (4.1)	9 (3.7)	0.749
Total	19 (15.6)	24 (19.8)	43 (17.7)	0.405
PHG	18 (14.8)	21 (17.4)	39 (16.0)	0.604
Reflux esophagitis	23 (18.9)	15 (12.4)	38 (15.6)	0.216
Gastric erosions	15 (12.3)	24 (19.8)	39 (16.0)	0.119
Duodenal erosions	18 (14.8)	8 (6.6)	26 (10.7)	0.060
Mass				
Gastric mass	7 (5.7)	2 (1.7)	9 (3.7)	0.172
Duodenal mass	2 (1.6)	1 (0.8)	3 (1.2)	1.000
Total	9 (7.4)	3 (2.5)	12 (4.9)	0.136
Gastritis	17 (13.9)	20 (16.5)	37 (15.2)	0.597

Endoscopic finding	Male, n (%)	Female, n (%)	Total, n (%)	*p* value
Duodenitis	3 (2.5)	5 (4.1)	8 (3.3)	0.500
Angiodysplasia	1 (0.8)	4 (3.3)	5 (2.1)	0.213
GAVE	0	3 (2.5)	3 (1.2)	0.122
Gastric polyp	1 (0.8)	3 (2.5)	4 (1.6)	0.370
Esophageal tear	1 (0.8)	0	1 (0.4)	1.000
Esophageal nodule	1 (0.8)	0	1 (0.4)	1.000
Normal endoscopy	8 (6.6)	24 (19.8)	32 (13.2)	**0.002**

A single patient could have more than one endoscopic finding; therefore, the percentages do not necessarily add up to 100%. Patients with overlapping subtypes within the same category were counted only once in the corresponding total. Significant p *values are shown in bold. GAVE, gastric antral vascular ectasia; PHG, portal hypertensive gastropathy.*

Table 4 shows the distribution of endoscopic findings across age groups. Duodenal erosions were significantly more common in the oldest age group (> 60 years; $p = 0.008$), whereas gastritis was significantly more common in younger patients (≤ 40 years; $p < 0.001$). The other endoscopic findings showed no statistically significant differences across age groups.

Table 4. Distribution of endoscopic findings by age group

Endoscopic finding	≤ 40 years, n (%)	41–60 years, n (%)	> 60 years, n (%)	*p* value
Peptic ulcer				
Gastric ulcer	0	4 (4.6)	5 (5.4)	0.146
Duodenal ulcer	6 (9.4)	13 (14.9)	6 (6.5)	0.173
Total	6 (9.4)	17 (19.5)	10 (10.9)	0.124
Variceal source				
Esophageal varices	7 (10.9)	17 (19.5)	17 (18.5)	0.330
Gastric varices	1 (1.6)	5 (5.7)	3 (3.3)	0.393
Total	8 (12.5)	18 (20.7)	17 (18.5)	0.415
PHG	5 (7.8)	15 (17.2)	19 (20.7)	0.093
Reflux esophagitis	6 (9.4)	15 (17.2)	17 (18.5)	0.268
Gastric erosions	9 (14.1)	11 (12.6)	19 (20.7)	0.304
Duodenal erosions	3 (4.7)	6 (6.9)	17 (18.5)	**0.008**
Mass				
Gastric mass	0	4 (4.6)	5 (5.4)	0.146
Duodenal mass	0	2 (2.3)	1 (1.1)	0.629
Total	0	6 (6.9)	6 (6.5)	0.082
Gastritis	23 (35.9)	11 (12.6)	3 (3.3)	**< 0.001**
Duodenitis	2 (3.1)	2 (2.3)	4 (4.3)	0.900
Angiodysplasia	2 (3.1)	2 (2.3)	1 (1.1)	0.640
GAVE	0	2 (2.3)	1 (1.1)	0.629
Gastric polyp	1 (1.6)	0	3 (3.3)	0.250
Esophageal tear	0	0	1 (1.1)	1.000
Esophageal nodule	0	1 (1.1)	0	0.621
Normal endoscopy	10 (15.6)	11 (12.6)	11 (12.0)	0.788

A single patient could have more than one endoscopic finding; therefore, the percentages do not necessarily add up to 100%. Patients with overlapping subtypes within the same category were counted only once in the corresponding total. Significant p *values are shown in bold. GAVE, gastric antral vascular ectasia; PHG, portal hypertensive gastropathy.*

4. Discussion

In this study, the overall proportions of males and females presenting with UGIB were almost equal, which is similar to the findings of Alema et al. in Uganda [17]. However, several international studies have shown a male preponderance of UGIB [5,18–20], and a similar male predominance was reported by Elghuel in a study conducted in Libya [21].

The mean age of patients with UGIB was 53.60 ± 18.71 years, which is close to that reported by Jemilohun et al. in Nigeria [22]. Patients aged > 60 years were the most affected by UGIB, consistent with results from other regions of the world [5,22]. In addition to being more susceptible to common causes of UGIB such as gastroesophageal varices and peptic ulcer disease, elderly people may be at increased risk of UGIB because of age-related cardiovascular and rheumatological conditions that necessitate the use of antiplatelets, anticoagulants and nonsteroidal anti-inflammatory drugs (NSAIDs) [23], although medication exposure was not assessed in the present study.

The commonest cause of UGIB in our study was esophageal varices, accounting for 16.9% of cases, while peptic ulcer was found in only 14.0% of patients. This is comparable to the study by El Faghih et al. in Libya [24] and to other studies conducted in developing countries [17,25], which also identified esophageal varices as the main cause of UGIB. In contrast, several other studies found peptic ulcer disease to be the most frequent cause of UGIB, including those by Elghuel in

Libya [21] and Jemilohun et al. in Nigeria [22]. Similarly, several studies conducted in Western countries have reported a higher prevalence of peptic ulcer disease than of esophageal varices [13,26]. One likely explanation for the relatively low frequency of peptic ulcers observed in our study is delayed endoscopy, because the endoscopic stigmata of recent ulcer bleeding may fade over time. Another possible explanation for the high prevalence of esophageal varices in our population is a high incidence of cirrhosis linked to viral hepatitis, as Libya has been considered a low-to-intermediate endemic area for hepatitis B and C viruses [27]; higher viral infection rates in some neighboring countries may also contribute. However, viral hepatitis and other etiologies of liver cirrhosis were not recorded in this cohort, so the contribution of viral hepatitis to the predominance of variceal bleeding in our population cannot be confirmed.

The second most common findings were PHG and gastric erosions, each accounting for 16.0% of cases. This agrees with the study by Malghani et al., which also found PHG to be the second most common finding among patients with UGIB in Pakistan [25]. The relatively high frequency of PHG may be explained by its frequent coexistence with varices in patients with liver cirrhosis, so PHG may have been a concomitant finding rather than the actual source of bleeding. Similarly, although gastric erosions are generally associated with less severe hemorrhage than peptic ulcer disease, they may frequently contribute to acute UGIB because they are relatively common. Therefore, the relatively high frequency of both conditions in our cohort may reflect their prevalence among patients presenting with UGIB rather than their likelihood of causing overt hemorrhage.

Peptic ulcer disease was significantly more common in males than in females (20.5% vs. 6.6%), which is compatible with the study by Elghuel [21]. This may be partly explained by gender differences in exposure to risk factors, particularly smoking, NSAID use and other lifestyle-related factors. However, these factors were not assessed in our study and therefore cannot be confirmed as explanations for this difference.

No source of bleeding was identified in 13.2% of patients, which is similar to studies from Africa [17,28] and higher than the rates reported from the Western world [26]. This is most likely because patients in Western countries typically undergo endoscopy sooner after UGIB than patients in most developing countries. Endoscopic diagnosis is influenced by the interval between the bleeding episode and endoscopy, as mucosal lesions are well known to heal quickly. In our endoscopy unit, EGD is usually performed several days after presentation, once hemodynamic stability and resuscitation have been achieved by other hospital units. This delay is due to a high patient load with a long waiting list and limited endoscopic resources and trained endoscopists.

Although epidemiological statistics are important for understanding the real situation [5], published data describing endoscopic findings in patients with UGIB in eastern Libya are scarce. This study has several limitations that should be considered when interpreting its findings. First, owing to its retrospective nature, several important variables were frequently missing, particularly *H. pylori* status, exposure to NSAIDs, aspirin, antiplatelets and anticoagulants, smoking and family history, clinical data such as vital signs at presentation and before the procedure, laboratory investigations, and the clinical outcomes of the bleeding episodes. Second, the study was carried out in a single tertiary care hospital in Benghazi and may therefore be affected by referral bias and may not be representative of the general population of patients with UGIB. Third, the exclusion of patients with incomplete medical records may have introduced selection bias, further limiting the representativeness of the study population. Fourth, delays in performing endoscopy may have introduced systematic bias, potentially leading to underestimation of lesions that heal spontaneously and overestimation of persistent lesions. Fifth, comorbidities were extracted from endoscopy reports and may have been poorly documented, resulting in underestimation of their prevalence.

These limitations have prompted us to initiate systematic prospective data collection to obtain more comprehensive information and produce more informative reports in the future. Furthermore, multicenter studies involving hospitals and clinics that provide endoscopic services are needed to better understand the etiologies, risk factors and clinical outcomes of UGIB.

5. Conclusion

Bleeding from esophageal varices was the most common cause of UGIB in this setting, whereas bleeding from peptic ulcer was relatively less common. Delayed endoscopy is likely the main driver of these key findings and may partly explain the low frequency of peptic ulcer and the high rate of normal endoscopy. These findings highlight the need for further investigation of the underlying hepatic diseases contributing to liver cirrhosis, improved screening and treatment of viral hepatitis, appropriate primary and secondary prophylaxis of variceal bleeding, and better access to timely endoscopy.

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Declarations

Author contributions: K.A.: conceptualization, methodology, data

collection and interpretation, formal analysis, writing (original draft preparation), and writing (review and editing). A.M.: supervision, conceptualization, and writing (review and editing). Y.A.: data interpretation, formal analysis, and writing (review and editing). A.E.: data interpretation, and writing (review and editing). Z.A.: data interpretation, and writing (review and editing). All authors read and approved the final manuscript and agreed to be accountable for all aspects of the work.

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Ethics approval and consent to participate: The study was approved by the research administration of the Libyan Board of Health Specialties (approval no. 52/194/2025, dated 2 April 2025) in accordance with the relevant guidelines and regulations. Patient consent was not required because the study was a retrospective evaluation of pre-existing medical data without any intervention. Patient confidentiality was preserved.

Data availability: The data of this study are available from the corresponding author upon reasonable request.

Use of generative AI: Artificial intelligence tools were used only for language editing and formatting. All scientific content remains the responsibility of the authors.

Supplementary material: Not applicable.

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