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Upper Gastrointestinal Bleeding in the Emergency Department of Ibn Sina Hospital in Rabat: Etiological, Endoscopic, Therapeutic and Evolutive Aspects

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Abstract **Original Research Article**

***Introduction*:** Upper gastrointestinal bleeding (UGIB) is defined as a bleeding from a lesion in the digestive tract located upstream of the duodenojejunal angle of Treitz. It is a medical emergency with a mortality ranging from 2 to 10%. The aim of the study is to investigate the main etiologies of upper gastrointestinal bleeding in our setting, and specify the main endoscopic findings, therapeutic approaches, and evolutive aspects. ***Materials and methods*:** A prospective, descriptive study conducted over an eight month period from May 1st to December 1st, including 50 adult patients admitted for UGIB who underwent conclusive esophagogastroduodenoscopy (EGD). We collected data about patients demographics, comorbidities, clinical presentaiton, physical examination findings, laboratory data, EGD results, therapeutic procedures and patient outcomes. ***Results*:** UGD represented 0.5% of emergency admissions, with a mean age of 61.22 years and no gender predominance. The main risk factors were related to the use of anticoagulants and/or antiplatelet agents, a history of chronic liver disease, chronic gastritis, and alcohol and tobacco use. Patients presented with hematemesis, melena, or both. EGD was performed in all patients, the main etiologies were peptic ulcer disease, vatical pathology and peptic pathology. Endoscopic treatment was performed in 38% patients, surgery was required in one case. Red blood cell transfusion was necessary in 83% patients. A favorable outcome was observed in 84% patients, while 16% patients died because of hemorrhagic shock, cardiogenic shock, and one case of multiple myeloma. ***Conclusion*:** UGIB remans a common medical and surgical emergency in our setting. The etiologies are dominated by peptic ulcer disease. EGD is the key investigation, with a diagnostic, therapeutic, and prognostic interest. The outcome was generally favorable in our study, except for 16% of cases who resulted in death. Preventive measures are essential.

Keywords: Upper Gastrointestinal Bleeding, Endoscopy, Emergency Medicine, Etiology, Therapeutics.

INTRODUCTION

Upper gastrointestinal bleeding (UGIB) is defined as bleeding from a lesion located upstream of the duodenojejunal angle of Treitz, particularly in the esophagus, stomach, or duodenum [1]. It constitutes a diagnostic and therapeutic emergency that can lead to death in the absence of adequate management. Its incidence has not decreased despite advances in prevention, due to an increase in life expectancy leading to a higher proportion of patients on anticoagulants and antiplatelet agents, with mortality ranging from 2 to 10% [2, 3]. The etiologies are multiple, with peptic ulcer disease and esophageal variceal bleeding related to portal hypertension being the most common. Esophagogastroduodenoscopy (EGD) plays a crucial role in the management, providing diagnostic, therapeutic, and prognostic value. The aim of our study is to elucidate the main etiologies of upper gastrointestinal bleeding in our setting, specify the main endoscopic findings, detail the therapeutic approaches, and describe the evolutive aspects.

MATERIALS AND METHODS

This is a prospective, descriptive study conducted over an eight-month period from May 1st to December 1st, 2022, involving 50 patients admitted for upper gastrointestinal bleeding (UGIB) to the emergency department of Ibn Sina Hospital in Rabat. We included adult patients (over 18 years old) who presented with

UGIB characterized by hematemesis and/or melena and who underwent conclusive esophagogastroduodenoscopy (EGD). Patients who did not meet the inclusion criteria or whose records were incomplete or unusable were excluded.

We collected the following data:

- Patient demographics: age and gender
- Comorbidities: chronic liver disease, chronic gastritis, progressive neoplasia, previous similar episodes of UGIB, chronic alcoholism, chronic smoking, and use of anticoagulants or antiplatelet agents prior to hospitalization
- Clinical presentation of UGIB (hematemesis and/or melena, severity of bleeding, associated symptoms)
- Physical examination findings: hemodynamic status (poor tolerance was defined as a heart rate greater than 90 beats per minute and a mean arterial pressure less than 65 mmHg), respiratory, neurological, and abdominal examination
- Laboratory data: complete blood count (CBC), prothrombin time (PT), activated partial thromboplastin time (aPTT), international normalized ratio (INR), serum electrolytes, renal function, and liver function tests
- EGD results
- Therapeutic management
- Patient outcomes: favorable (discharge or transfer) or unfavorable (death).

RESULTS

We collected data on fifty patients between May 1st and December 1st, 2022, out of approximately 9000 emergency department admissions, representing a rate of 0.5% of all hospitalizations. The mean age was 61.22 years, with a range from 20 to 90 years. There were 26 male patients and 24 female patients, with a male-to-female ratio of 1.08 (M/F).

The comorbidities identified were chronic liver disease in 16% of cases (n=8, including viral hepatitis A, post-viral cirrhosis B, C, idiopathic cirrhosis, autoimmune hepatitis, and portal hypertension due to veno-occlusive disease), chronic gastritis in 12% (n=6, including gastric linitis, medically treated ulcers, clipped or operated ulcers), 36 patients (n=18) on antiplatelet and/or anticoagulant therapy, and 6% (n=3) with progressive neoplasms (hepatocellular carcinoma, prostate adenocarcinoma, multiple myeloma). Additionally, 14% of patients (n=7) had experienced at least one previous episode of UGIB, and 12% had toxic habits (2 cases of chronic smoking, 4 cases of chronic smoking and alcoholism). Other risk factors included one case of stabbing with hepatic injury and one case of idiopathic megaesophagus treated with dilation. Furthermore, 28% of patients (n=14) had no identified risk factors.

Clinically, 24% of patients presented with isolated hematemesis, 32% with isolated melena, and 44% with a combination of hematemesis and melena. Epigastric pain was reported in 32% of patients (n=16), while food vomiting and dysphagia were noted in 2 patients. Physical examination findings were dominated by pallor (82% n=41), melena on rectal examination (74% n=37), ascites (26% n=13), followed by collateral venous circulation, lower limb edema, hepatomegaly (14% n=7), splenomegaly (8% n=4), jaundice in one patient, and pleural effusion in two patients. Nine patients (18%) presented with hemorrhagic shock, while bleeding was well- tolerated in 41 patients (82%). Five patients (10%) had profuse hematemesis, and two patients (4%) had profuse melena.

Laboratory findings showed that 29 patients (58%) had anemia with a hemoglobin level below 7g/dl, and 45 patients (90%) had a hemoglobin level below 10g/dl. Normocytic normochromic anemia was present in 29 patients (58%), and the rest had hypochromic microcytic anemia. Five patients (10%) had thrombocytopenia (<100,000/mm3), 13 patients (26%) had a PT below 70%, and 3 patients (6%) had an INR >3. Additionally, renal insufficiency was found in 16 patients (32%), of which 7 (14%) were functional.

Esophagogastroduodenoscopy (EGD) was performed in all patients, leading to an etiological diagnosis in 96% of cases. The average delay for performing EGD was 3.16 days. EGD revealed:

- Ulcerative lesions in 23 patients (46%): two Forrest IB ulcers, three Forrest IIa ulcers, four Forrest IIc ulcers, and 14 Forrest III ulcers.
- Erythematous gastritis in 19 patients (38%).
- Peptic esophagitis in 9 patients (18%), including 4 at Los Angeles grade A, one at grade B, one at grade C, and three at grade D.
- Variceal pathology in 15 patients (30%), including two cases of gastroesophageal varices (GOV I and GOV II) and 13 cases of esophageal varices (1 stage I, 4 stage II, and 8 stage III).
- Mallory-Weiss syndrome in 3 patients (6%).
- Tumoral pathology in 4 patients (8%) (2 ulcerated budding processes, 1 hemorrhagic budding process, 1 nodular process).
- Vascular malformations in 4 patients (8%), including 3 duodenal angiodysplasias and one fundic angiodysplasia.
- Hiatal hernia in 3 patients (6%).
- Normal EGD findings in 2 patients (4%).

Regarding imaging, abdominal CT scans were performed in 4 patients (8%) for tumor staging and in 5 patients (10%) for diagnostic uncertainty. Ultrasound was performed in 4 patients (8%) for liver morphological evaluation and quantification of peritoneal effusion.

All patients received intravenous isotonic saline fluid resuscitation. Red blood cell transfusion was necessary in 83% of patients (n=43) with an average of 3 units per patient. Six patients (12%) also received fresh frozen plasma (FFP) transfusion. Norepinephrine was required in 9 patients (18%) due to hypotension unresponsive to initial fluid resuscitation. An 80mg bolus of omeprazole was administered to all patients upon admission, with a maintenance dose of 8mg/h prescribed for ulcerative and erosive pathology. Octreotide was prescribed in 12 patients (24%) with variceal pathology, and tranexamic acid was administered in 3 patients (6%).

Endoscopic intervention was performed in 19 patients (38%), including clipping of ulcerative pathology in 6 patients (12%), banding of esophageal varices with elastic bands in 9 patients (18%), and adrenaline injection in 3 patients (6%). Surgical intervention was required in one case, for a patient with a right hepatic artery arteriovenous fistula complicated by a partially thrombosed false aneurysm of the right hepatic vein. The procedure performed was ligation of the right hepatic artery.

Transfusion outcomes were good in all transfused patients, with a target hemoglobin level of 10g/dl in patients with a cardiopathy and 7g/dl in the rest of the patients. The average length of stay in the emergency department before transfer to a specialized department or discharge home was 4.3 days. A favorable outcome was observed in 42 patients (84%), while 8 patients (16%) died. Deaths were related to hemorrhagic shock in 5 patients (10%), cardiogenic shock in 2 patients (4%), and multiple myeloma in one patient (2%).

DISCUSSION

Numerous epidemiological studies conducted in the last two decades have shown a decrease in the incidence of upper gastrointestinal bleeding (UGIB). This trend can be explained by the eradication of Helicobacter pylori, the use of proton pump inhibitors, access to endoscopy, and primary prophylaxis with beta-blocker treatment and variceal ligation [4]. In the United States, a study conducted in 2022 showed a decrease in UGIB incidence in the emergency department between 2006 and 2014 (from 112.3 to 94.4 per 100,000 population), followed by an increase to 116.2/100,000 population in 2019 [5]. This increase could be attributed to the higher life expectancy leading to an increase in hemorrhages caused by antiplatelet and anticoagulant treatments. A study conducted in Egypt in 2015 found an incidence of 150/100,000 population per year with a mortality rate of up to 10% [6].

During our study period, UGIB represented 0.5% of emergency department admissions, with a predominance in patients over 60 years old. The risk factors for UGIB found in our study are mainly related to the use of anticoagulants and/or antiplatelet agents, a history of chronic liver disease, a history of chronic gastritis, and alcohol and tobacco habits. These data are consistent with the literature. According to a study conducted in the United States in 2021, the most frequent risk factors for UGIB are a history of UGIB (relative risk RR = 13.5), anticoagulant use (RR = 12.7), high-dose nonsteroidal anti-inflammatory drug use (RR = 5.8), and advanced age (RR = 5.6). Renal insufficiency is a risk factor for UGIB, particularly during the first year of hemodialysis due to platelet dysfunction and hemostatic abnormalities present in these patients [7]. Alcoholism increases the risk of cirrhosis, hypertension, and consequently variceal bleeding, while smoking increases the incidence of gastroduodenal ulcers and gastrointestinal neoplasms [8].

The etiologies of UGIB mainly include peptic ulcer disease, gastritis, esophagitis, and variceal bleeding [9]. Other less common etiologies may include Mallory-Weiss syndrome, Dieulafoy ulceration, pancreatic or biliary bleeding, aortoenteric fistulas, and neoplasms [10]. In our study, the main etiologies of UGIB were peptic ulcer disease, variceal pathology, and peptic pathology.

The positive diagnosis is easily made when UGIB is externalized, which can be hematemesis, melena, or hematochezia. In the presence of severe active bleeding, it may present as profuse rectal bleeding mimicking lower gastrointestinal bleeding. Finally, it should be considered in cases of shock or unexplained unease. A careful rectal examination should be performed.

The placement of a nasogastric tube to establish the diagnosis and perform lavage to ensure gastric emptying is mentioned in the formalized expert recommendations of the SRLF in 2012 [11]. In 2021, the European Society of Gastrointestinal Endoscopy does not recommend performing nasogastric or orogastric aspiration or lavage as it does not differentiate between upper and lower gastrointestinal bleeding and is associated with adverse events (pain, epistaxis, placement failure). Therefore, placing a gastric tube for this purpose is not routinely practiced in our institution [12]. In our study, 12 patients presented with hematemesis, 16 with melena, and 22 with both. Biochemically, a urea/creatinine ratio >30 indicates an upper source of bleeding [2]. Anemia is typically normocytic in acute UGIB and microcytic in chronic UGIB.

The assessment of severity is based on the abundance and impact of bleeding, the patient's condition, and specific scores. Pre-endoscopy scores (Rockall, Glasgow Blatchford, and AIMS65) identify high-risk patients and guide them to an appropriate level of care. A Rockall score above 8 indicates a high risk of mortality, and a Glasgow Blatchford score above 8 requires transfer to intensive care. The use of the Glasgow Blatchford score was recommended in 2021 by

the American College of Gastroenterology and the European Society of Gastrointestinal Endoscopy for risk stratification [12, 13]. Despite these recommendations, its use is not common in our institution.

In the presence of massive bleeding, the principles of hemorrhagic shock resuscitation apply. Extrapolated from trauma shock, some particularities must be taken into account for upper gastrointestinal bleeding. The principle of permissive hypotension with a mean arterial pressure (MAP) of 65 mmHg and a systolic arterial pressure (SAP) of 90 mmHg is maintained, as well as limiting fluid replacement and early vasopressors to limit dilutional coagulopathy. This approach also prevents excessive volume expansion that may increase splanchnic flow [14]. Therefore, a restrictive strategy for blood transfusion is adopted with hemoglobin targets of 7-8 g/dl, increased to 10 g/dl in cardiac patients [12, 13]. A more liberal strategy is associated with a higher risk of recurrent bleeding, in addition to classic transfusion-related complications [2]. Regarding tranexamic acid, the HALT-IT study did not show a benefit in mortality compared to placebo in gastrointestinal bleeding. Its use was also associated with an increased number of thromboembolic events. Therefore, it is not recommended in this indication [12]. Controversially used in our context, tranexamic acid was administered to only 3 patients in our study.

Hemostatic resuscitation involves the national protocol for massive transfusion with red blood cell transfusion, platelet concentrates, and fresh frozen plasma. Ionized calcium concentration is monitored and maintained within normal values. One particularity concerns gastrointestinal bleeding related to portal hypertension in cirrhotic patients. These patients often present with a low prothrombin time, but this does not necessarily indicate an excessive risk of bleeding. In this situation, there is a deficiency in both procoagulant and anticoagulant factors, increasing the risk of thromboembolism. Therefore, this biochemical abnormality should not be corrected by transfusing fresh frozen plasma, as the volume expansion accompanying this transfusion may worsen portal hypertension. Platelet transfusion is indicated only in cases of active bleeding with a platelet count <50,000/mm3 [2]. For antiplatelet agents, aspirin is discontinued when used for primary prevention (a controversial indication) and maintained for secondary prevention (its interruption triples the risk of adverse cardiac events) with discontinuation of clopidogrel. Regarding anticoagulants, vitamin K antagonists (VKAs) are stopped with vitamin K, prothrombin complex concentrate (PCC), and if unavailable, with FFP administration [12]. American recommendations suggest that endoscopy can be performed in patients with an INR <2.5 [16]. Direct oral anticoagulants (DOACs) are stopped, or antagonized with PCC when bleeding is severe [12]. In our study, 6 patients received FFP, 3 as part of a massive transfusion protocol and 3 for VKA treatment in the absence of PCC, which is unavailable in our setting.

Regarding upper airway management, prophylactic intubation to reduce the risk of aspiration and adverse cardiovascular events is associated with an increased risk of pneumonia and higher mortality. Therefore, it should be reserved for patients with active hematemesis, agitation, encephalopathy with no airway protection, or in the context of general anesthesia for endoscopy in patients who do not tolerate conscious sedation [3, 12]. Intravenous erythromycin administered at a dose of 250 mg 30 minutes to 2 hours before endoscopy promotes gastric emptying and reduces the need for repeated endoscopy [2]. It is not used in our institution due to its unavailability.

In cases of suspected ulcerative bleeding, administering proton pump inhibitors (PPIs) before endoscopy (80 mg bolus dose followed by 8 mg/h maintenance dose) improves endoscopic grade and reduces the need for endoscopic intervention [12]. However, although widely practiced and recommended by the European Society of Gastrointestinal Endoscopy, their administration before endoscopy is not universally recommended, as it does not impact patient outcomes [3, 12, 13]. PPI administration after endoscopy is recommended to reduce the risk of recurrent bleeding in ulcer bleeding, while it should be discontinued if the bleeding origin is variceal due to the infectious risk in this population [11-13]. Thus, in our study, a bolus dose of omeprazole was administered to all patients, while the maintenance dose was reserved for patients with ulcerative or erosive pathology.

In cases of suspected variceal bleeding, vasoactive treatment reducing portal blood flow (continuous intravenous Octreotide 25 mcg/h or Somatostatin 250 mcg IV followed by 250 mcg/h or Terlipressin 1-2 mg IV every 4 hours) is recommended for up to 5 days [17, 18]. A switch to beta-blockers is then made. Furthermore, antibiotic prophylaxis should be instituted for up to 7 days to prevent infectious risk in cirrhotic patients, with the choice of antibiotics depending on the local ecology, with 1g/day IV ceftriaxone being recommended for patients with advanced cirrhosis, in settings with a high prevalence of quinolone resistance or in the presence of prior quinolone prophylaxis. In our context, antibiotic prophylaxis is administered with quinolones or ceftriaxone based on these risk factors.

The current recommended time frame for performing an endoscopy is 24 hours [12, 13]. Performing an endoscopy within the first 24 hours would shorten hospital stays and reduce healthcare costs [3]. A Danish study showed that unstable patients benefited most from endoscopy within 6 to 24 hours of admission, as mortality increased before 6 hours or beyond 24 hours [19]. Finally, recommendations regarding variceal

bleeding suggest a timeframe of less than 12 hours for this indication [18]. Overall, the exact timing of endoscopy depends on the patient's hemodynamic status, comorbidities, and optimization for the procedure. The mean time to endoscopy in our setting was 3.16 days, beyond what is recommended.

Endoscopy allowed for an etiological diagnosis in 96% of cases, with an etiological profile replicating that of the literature [4]. Regarding peptic ulcer disease, clips and thermal therapy have shown comparable efficacy. Adrenaline should not be used alone but rather in combination with another therapeutic modality, as it only provides temporary bleeding control and aids in visualization [2, 3]. Thus, only actively bleeding ulcers or those with an adherent vessel or clot are treated endoscopically. In our study, 6 patients received a clip and 3 patients received adrenaline injection. Treatment of esophageal varices involves elastic band ligation, and that of gastric varices involves cyanoacrylate injection. It should be performed during the initial endoscopy, which was the case for the 9 patients in our study. Balloon tamponade remains reserved for refractory bleeding cases as a transitional treatment for a maximum of 24 hours due to frequent complications [18]. They have no place in our context. Transjugular intrahepatic portosystemic shunt (TIPS) should be performed early, within 72 hours, in patients at high risk of treatment failure (Child B with active bleeding on endoscopy or Child C with a score of less than 14 points), in patients with persistent bleeding despite combined pharmacological and endoscopic treatment, and in those with severe rebleeding episodes within 5 days of bleeding, and in cases of isolated gastric varices or gastroesophageal varices. In our facility, TIPS placement is available but no patients underwent this procedure in our series.

Arteriography with embolization generally precedes surgical treatment, with surgery being recommended in the absence of bleeding control, if interventional radiology is not available, or in cases of recurrent bleeding and hemodynamic instability. For patients with no identified cause of upper gastrointestinal bleeding, evaluation of the small intestine by enteroscopy or capsule endoscopy should be considered to look for a source of intestinal bleeding. In our series, only one patient required surgical intervention to control bleeding.

Mortality related to UGIB ranges from 2 to 10% [20, 21]. It has decreased over the past two decades due to advances in resuscitation and endoscopy [22]. However, some studies report a static mortality rate, which can be explained by older patient age with more significant comorbidities. Thus, we had a 16% mortality rate with 10% hemorrhagic shock and 6% decompensated comorbidities (cardiogenic shock and myeloma).

CONCLUSION

Upper gastrointestinal bleeding remains a common medical and surgical emergency in our setting, sometimes fatal. The etiologies are dominated in our study by peptic ulcer disease. In our series, 50 patients were admitted to the emergency department for UGIB, with no clear gender predominance. Esophagogastroduodenoscopy remains the key examination with triple interest: diagnostic, therapeutic, and prognostic. Medical treatment follows current recommendations, and surgery is sometimes necessary when bleeding is not controlled by other therapeutic measures. The outcome is generally favorable with a clear clinical and biological improvement except in 16% of cases that resulted in death. Preventive measures are essential to prevent UGIB, possibly through screening for H. pylori gastritis, controlling comorbidities, and cessation of alcohol and tobacco use.

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