



Treatment Tactics and Diagnostic Criteria for Gastrointestinal Bleedings

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ABSTRACT

Gastrointestinal bleeding is a relatively common and serious form of gastrointestinal hemorrhage. It can be precisely defined as bleeding within the intestinal tract, originating from the ligament of Treitz. In Western countries, it tends to be more prevalent in men than in women. Potential causes include peptic ulcer disease (PUD), gastric arteriovenous malformation, Mallory-Weiss tears, aortoenteric fistula, and malignancies like squamous cell carcinoma (SCC). This type of bleeding accounts for approximately 75% of all cases and necessitates meticulous diagnostic and treatment approaches. The risk of rebleeding should be evaluated using scoring systems such as Rockall and Blatchford scoring. Effective diagnosis and treatment strategies heavily rely on the expertise of professionals in interventional radiology, internal medicine, emergency medicine, gastroenterology, and general surgery.

In this study, we emphasize that the diagnosis and treatment strategies are critically dependent on the collaboration of experts in interventional radiology, internal medicine, emergency medicine, gastroenterology, and general surgery. This review article aims to provide a concise overview of diagnostic procedures and treatment approaches, offering valuable guidance to physicians and clinical practitioners for the effective management of gastrointestinal bleeding patients.

Keywords:

Upper gastrointestinal bleeding, arteriovenous malformation, Mallory Weiss tears, Cancer, Endoscopy

Introduction

We conducted an electronic search for adult patients (18 years and older) presenting with acute gastrointestinal bleeding (GIB) at the emergency department (ED) of Chang Gung Memorial Hospital in Taoyuan County, Taiwan. This hospital is a tertiary care, university-affiliated institution. The inclusion criteria comprised patients admitted with a diagnosis of gastrointestinal bleeding based on International Classification of Diseases, Ninth Revision codes 5780, 5781, and 5789, within the period of January 2006 to July 2006. Specifically, patients with bleeding esophageal varices (coded as 4650) were excluded from the study. The selected

patients were confirmed to have upper gastrointestinal bleeding (UGIB) without bleeding esophageal varices upon endoscopy.

Gastrointestinal bleeding encompasses any form of bleeding originating within the gastrointestinal tract, as illustrated in Figure 1. It can emanate from various sites along the tract, commonly categorized into upper GI bleeding (involving the esophagus, stomach, and initial part of the small intestine) and lower GI bleeding (encompassing a significant portion of the small intestine, large intestine, rectum, and anus).

Prior to endoscopy, all patients received intravenous proton pump inhibitors (specifically, omeprazole or pantoprazole).

Exclusion criteria included patients who did not undergo endoscopy, were not administered proton pump inhibitors, were under the age of 18, or experienced bleeding from a lower-GI source. Recurrent bleeding was defined by events such as repeated endoscopy prior to hospital discharge, surgery for UGIB control, or readmission within 30 days of discharge due to UGIB.

The identified patients had their medical records scrutinized for initial vital signs and laboratory test results obtained upon presentation at the ED with UGIB. Additionally, demographic data, clinical presentation, presence of comorbid medical conditions (as assessed by the Charlson comorbidity index), endoscopy findings, units of blood transfused, UGIB treatment modalities, and medications taken at admission were reviewed. This review article focuses on diagnostic and treatment options for upper gastrointestinal bleeding.

1.1 Initial assessments

To evaluate the platelets, haemoglobin, and hematocrit, a complete blood count (CBC) should be included in the initial diagnostic test. Additionally, the international normalised ratio, type and cross matches, liver function tests, partial thromboplastin time, and prothrombin time are also examined. Depending on the patient's circumstances, such as coagulopathy and thrombocytopenia, frozen fresh plasma and platelets must be transfused. In order to maintain the haemoglobin level at 9 g/dL, haemoglobin levels below 7 g/dL may be

taken into consideration for blood transfusions. Blood pressure and pulse rate can be monitored to prevent conditions like hypotension and tachycardia. For surgical scars, chronic liver illness, and occult blood testing, respectively, a physical examination and rectal examination may also be performed. The patient's medical history must be obtained, and current medications must be taken into consideration, particularly any history of aspirin, NSAIDs, coumadin, Plavix, and corticosteroids use. Other factors to take into account include history of surgery, peptic ulcer disease, or alcohol usage in the past. [12].

1.2 Analysis of assessments and risks

In patients with acute and severe bleeding, diagnostic investigations should be immediately followed by swift assessment and resuscitation [13]. By using a bleeding score like the Glasgow Blatchford Score or the Rockall Score, complications and rebleeding should be assessed [3,14]. The Glasgow Blatchford Score is based on patient clinical symptoms such as pulse rate, melena, systolic blood pressure, heart failure, and liver illness as well as laboratory values such as haemoglobin and blood urea nitrogen. The Rockall Score is based on endoscopic data. Studies using meta-analysis show that the Blatchford Score at level zero lowers the likelihood of urgent intervention; as a result, this scoring system is better advised in cases of first assessment of potentially acute UGIB as seen in emergency departments. [3].

Rockall Scoring System				
Variable	Score=0	Score =1	Score =2	Score =3
Age (years)	<60	60-79	>80	
Comorbidity			Congestive heart failure, ischemic heart disease	Renal failure, liver disease, metastatic disease
Shock	No shock	Pulse > 100 bpm	Systolic BP <100 mmHg	
Source of bleeding	Mallory-Weiss Tear	All other diagnoses: e.g., esophagitis, gastritis, peptic ulcer disease, varices	Malignancy	
Stigmata of recent bleeding	None		Adherent clot or spurting vessel	

Table.1: Rockall scoring systems in upper gastrointestinal bleeding

1.2.1 Endoscopy

Endoscopy is thought to be an important diagnostic and treatment tool for UGIB. This method might help reduce the likelihood of active bleeding, which would reduce the need for surgery, the length of hospital stay, and the number of packed erythrocyte units required for blood transfusions. The primary method of diagnosis for UGIB is esophagogastroduodenoscopy. Stigmata of recent haemorrhage (SRH) is the primary factor driving the effectiveness of endoscopic therapy [15]. When determining the requirement for endoscopic therapy, SGH denotes the prediction values on the risk of further bleeding. They have received a great deal of attention in the setting of bleeding ulcers, which may eventually result in UGIB [16]. It is recommended that early upper endoscopy should be performed within 24 hours of presentation in the patients with UGIB to confirm the diagnosis. Endoscopy is thought to be an important diagnostic and treatment tool for UGIB. This method might help reduce the likelihood of active bleeding, which would reduce the need for surgery, the length of hospital stay, and the number of packed erythrocyte units required for blood transfusions. The primary method of diagnosis for UGIB is esophagogastroduodenoscopy. Stigmata of recent haemorrhage (SRH) is the primary factor driving the effectiveness of endoscopic therapy [15]. When determining the requirement for endoscopic therapy, SGH denotes the prediction values on the risk of further bleeding. They have received a great deal of attention in the setting of bleeding ulcers, which may eventually result in UGIB [16].

How-ever, studies regarding the optimal time for endoscopy conclude that very early endoscopy has no relation with reduction in the risk of rebleeding as well as improved survival [13, 17]. The risks associated with upper endoscopy might be increased bleeding while treatment, aspiration, perforation and side effects due to sedation [3].

1.2.2. Radionuclide scanning

Nuclear medicine techniques are the efficient diagnostic approaches that may accurately detect the bleeding locations in patients whose initial diagnostics are either negative or equivocal [18]. The most sensitive imaging method for identifying the site of gastrointestinal bleeding, bleeding scintigraphy, was originally developed in the late 1990s and is essential to patient management. In order to localize acute gastrointestinal bleeding, two radioactive tracers—Technetium-99m-labeled Sulphur colloid (SC) and Technetium-99m-labeled red blood cells—are generally used [18–20]. The use of these radionuclides allows for the non-invasive detection of pathological and physiological issues. For instance, Meckel's diverticulum can be evaluated with technetium-99m paratechnetate. [20].

MDCT angiography, or multidetector computed tomography

For providing visual structural resolutions of pathological conformities, such as inflammation and infection, modern imaging techniques have significantly contributed to the detection of illnesses [21]. Radiation-based computed tomography (CT) is used to identify diseases in the colon, cortical bone, lung parenchyma, and airways [22]. Due to its ease of acquisition and accessibility, it has also played a distinctive role in the identification of hemodynamically stable gastro-intestinal haemorrhage. It is possible to employ CT angiography to guide the next clinical operations. Additionally, it can identify disorders such haemobilia that do not affect the gastrointestinal tract [23]. The drawbacks of CT angiography may include high radiation exposure, radionuclide imaging insensitivity, and a lack of specificity in many pictures [21, 23].

1.2.3. Catheter angiography

For the diagnosis of both upper and lower gastrointestinal bleeding, this specific approach might be used. It is especially helpful for patients who experience therapeutic endoscopic failure. Acute UGIB and LGIB that cannot be controlled by

endoscopy or surgery are treated with catheter angiography as the first-line modality due to the availability of micro-catheters and embolic materials with super-selective embolization. When patients are at risk for surgery, transcatheter arteriography may be the first course of treatment. This treatment offers less negative effects and a 65% patient success rate in a clinical setting. It is a safe treatment option for people who have severe gastrointestinal bleeding in the case of lower gastrointestinal bleeding. Transcatheter angiography has few restrictions, however rebleeding can happen when gastrointestinal bleeding originates in the jejunum, ileum, or cecum [24]. Catheter angiography can detect the bleeding rate of as low as 0.5 mL/min and is highly sensitive as well as specific in nature, hence, can be employed as the primary imaging, as well as treatment modality in the patients encountering gastrointestinal bleeding [23].

1.2 Management of upper digestive haemorrhage

UGIB is a highly fatal emergency condition with high mortality and morbidity. Nowadays, a decline in the mortality rate has been noticed i.e.,

2.1 percent from 4.5%. This ameliorated rate of mortality can be attributed to recent advancements especially endoscopic therapy and decline in peptic ulcer disease [25]. The patients suffering from UGIB must undergo step-wise approach in order to avoid some serious consequences [5]. The overall strategy to handle UGIB patients in emergency set ups can be divided into three stages namely; pre-endoscopy, endoscopic and post endoscopic management [25, 26].

1.2.4. Pre endoscopic management

As an initial step, hemodynamic status of the patient and primary re-suscitative efforts is required, which may include fluids as well as blood transfusion. After that, patient should be stratified on the basis of initial presentation, age, preliminary lab tests, comorbidities and hemodynamic status [5]. This can be done using scoring systems (Rockall and Blatchford scores) as described in

the above sections. In different clinical contexts, UGIB can be managed by using vasoactive agents, prophylactic antibiotics and proton pump inhibitors (PPI) [25].

1.2.5. Endoscopic therapy

Clinical recommendations advocate performing endoscopies within 24 hours, but in high-risk circumstances including variceal haemorrhage, unstable hemodynamics, and extensive hematemesis, endoscopies should be performed as soon as the patient is stable [27]. In order to classify endoscopic findings in patients with bleeding ulcers and predict the likelihood of rebleeding, J.A. Forrest established the Forrest Classification in 1974. According to predictions, ulcers with flat bases have a 5% chance of rebleeding, stigmatised ulcers have a 10-43% chance, and active bleeding ulcers have a 55% chance [28].

In addition to the implantation of hemoclips and bipolar electrocoagulation, the endoscopic therapy with high risk stigmata requires the injection of epinephrine in order to improve blood vessel constriction and pressure blockage [29].

1.2.6. Post-endoscopy management

Endoscopic evaluation is normally followed by reduced risk of re-bleeding in the patients with stable vital signs such as normal level of hemoglobin, minimal or no comorbidities and an endoscopic lesion with low risk of rebleeding. PPI therapy should be continued till 72 hours of

endoscopy in the patients with high risk stigmata of recent bleeding. Such patients are required to prescribe a clear liquid diet followed by the diet as tolerated. Contrary to that, patients with low risk of rebleeding should be advanced to oral PPI once a day and initiated on a regular diet. In case of idiopathic ulcers, endoscopy is performed after intervals in order to reduce the risk of any malignancy, moreover, in case of severe esophagitis repeated endoscopy reduces the risk of Barrett esophagus [28].

1.3 System integration for healthcare

A state-of-the-art interprofessional team composed of an emergency department

physician, a surgeon, an internist, and a gastroenterologist is considered to be necessary for the diagnosis and therapy of UGIB. Advanced trauma life support (ATLS) protocol should be the foundation for the initial course of treatment. The two most widely used scoring systems are Rockall and Glasgow Blatchford scores. Additionally, an upper endoscopy must be scheduled within 24 hours of admission to the emergency room in order to diagnose the cause of the bleeding and implement additional management techniques [5].

There is an estimated success rate of 80% to 90% of endoscopic therapy in the patients, as investigated by the natural history of patients, who may completely stop rebleeding after treatment. It is however, recommended that a second endoscopic procedure should be offered to 10-20% of patients who continue to bleed even after endoscopic procedure. If bleeding continues to occur, other modalities like angiography or surgery should also be considered [5, 30, 31].

Conclusions

Gastrointestinal bleeding is a critical condition frequently encountered in emergency departments, with a notable mortality rate. Recent years have seen a decrease in mortality thanks to advanced therapeutic techniques like endoscopy. Accurate diagnosis hinges on considerations of the type of gastrointestinal bleeding, risk assessment, and clinical manifestations that unveil both the form and origin of the bleeding. Given the wide array of underlying causes and concurrent conditions, diagnostic procedures and treatment approaches can vary significantly.

While upper endoscopy is the primary recommended method for initial examination, angiography and radionuclide imaging offer superior accuracy in diagnosing acute overt gastrointestinal bleeding. A comprehensive understanding of gastroenterology, general surgery, and nuclear medicine is imperative in comprehending the nature and source of upper gastrointestinal bleeding (UGIB),

ensuring the most effective management of this potentially life-threatening scenario.

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