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EDITORIAL

- 5448 Diagnostic challenges from conflicting results of tests and imaging
Yu R
- 5452 Are case reports valuable? Exploring their role in evidence based medicine and patient care
Suvvari TK
- 5456 Recent advances in managing obstructive sleep apnea
Nag DS, Chatterjee A, Patel R, Sen B, Pal BD, Wadhwa G
- 5462 Importance of risk assessment, endoscopic hemostasis, and recent advancements in the management of acute non-variceal upper gastrointestinal bleeding
Maity R, Dhali A, Biswas J
- 5468 Navigating treatment resistance: Janus kinase inhibitors for ulcerative colitis
Soldera J
- 5473 Clues for diagnosing misplaced central venous catheter in the right ascending lumbar vein during right femoral venous access
Tokumine J, Moriyama K, Yorozu T

MINIREVIEWS

- 5476 Exploration of the complex origins of primary constipation
Zeng XL, Zhu LJ, Yang XD

ORIGINAL ARTICLE**Retrospective Study**

- 5483 Influence of humanistic care-based operating room nursing on safety, recovery, and satisfaction after radical surgery for colorectal carcinoma
Wang XP, Niu M
- 5492 Correlation between TEX14 and ADAM17 expressions in colorectal cancer tissues of elderly patients and neoplasm staging, invasion, and metastasis
Chen G, Cong LH, Gu CJ, Li P
- 5502 Assessment of early factors for identification or prediction severe acute pancreatitis in pregnancy
Mei LF, Gan Q, Hu J, Li YX, Tian R, Shi CJ
- 5513 Application value of machine learning models in predicting intraoperative hypothermia in laparoscopic surgery for polytrauma patients
Zhu K, Zhang ZX, Zhang M

Clinical Trials Study

- 5523 Effectiveness of the A3 robot on lower extremity motor function in stroke patients: A prospective, randomized controlled trial

Zhang LJ, Wen X, Peng Y, Hu W, Liao H, Liu ZC, Liu HY

- 5534 Effect of dietary with Zhibai dihuang pills and gonadotropin-releasing-hormone-analogue on girls with precocious and rapidly progressive puberty

Wang XM, Li W, Yang LQ, Luo R, Zhang CC

Randomized Controlled Trial

- 5542 Clinical efficacy, bone density, and follow-up in implant and orthodontic treatment for inclined adjacent teeth

Yang Y, Zhou SC, Ma YH, Wang X, Dong QS

- 5549 Information-motivation-behavioral guided nursing for stroke patients with pulmonary dysfunction: A randomized controlled trial

Peng X, Ni HQ, Liu YM, Zhu JL, Bai YT

- 5558 Application of buried auricular point combined with Wenjing Sanhan prescription in arteriosclerosis obliterans patients with resting pain

Li YP, Su T, Xue XL, Shi HR, Su ZH, Li J

Clinical and Translational Research

- 5568 Computed tomography-based radiomics predicts the fibroblast-related gene *EZH2* expression level and survival of hepatocellular carcinoma

Yu TY, Zhan ZJ, Lin Q, Huang ZH

CASE REPORT

- 5583 Endometrial carcinoma with cervical stromal invasion: Three case reports

Liu MM, Liang YT, Jin EH

- 5589 IgG4-related sclerosing cholangitis associated with essential thrombocythemia: A case report

Wu ZN, Ji R, Xiao Y, Wang YD, Zhao CY

- 5596 Are all primary omental infarcts truly idiopathic? Five case reports

Kar H, Khabbazazar D, Acar N, Karasu Ş, Bağ H, Cengiz F, Dilek ON

- 5604 Seven-years post allogeneic hematopoietic stem cell transplantation pure red cell aplastic anemia cured with daratumumab: A case report and review of literature

Deng B, Gao R, Yang B, Lei WB, Xue MF, Wang JS, Zhao P

- 5613 Splenic subcapsular hematoma following endoscopic retrograde cholangiopancreatography: A case report and review of literature

Guo CY, Wei YX

- 5622** “Keyboard sign” and “coffee bean sign” in the prenatal diagnosis of ileal atresia: A case report
Fei ZH, Zhou QY, Fan L, Yin C
- 5628** Treatment of nasopharyngeal carcinoma and prevention of non-alcoholic Wernicke’s disease: A case report and review of literature
Ma YY, He XC, Gao Y, Ma TT, Cheng G, Yue CW

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Importance of risk assessment, endoscopic hemostasis, and recent advancements in the management of acute non-variceal upper gastrointestinal bleeding

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Abstract

Acute non-variceal upper gastrointestinal bleeding (ANVUGIB) is a common medical emergency in clinical practice. While the incidence has significantly reduced, the mortality rates have not undergone a similar reduction in the last few decades, thus presenting a significant challenge. This editorial outlines the key causes and risk factors of ANVUGIB and explores the current standards and recent updates in risk assessment scoring systems for predicting mortality and endoscopic treatments for achieving hemostasis. Since ANUVGIB predominantly affects the elderly population, the impact of comorbidities may be responsible for the poor outcomes. A thorough drug history is important due to the increasing use of antiplatelet agents and anticoagulants in the elderly. Early risk stratification plays a crucial role in deciding the line of management and predicting mortality. Emerging scoring systems such as the ABC (age, blood tests, co-morbidities) score show promise in predicting mortality and guiding clinical decisions. While conventional endoscopic therapies remain cornerstone approaches, novel techniques like hemostatic powders and over-the-scope clips offer promising alternatives, particularly in cases refractory to traditional modalities. By integrating validated scoring systems and leveraging novel therapeutic modalities, clinicians can enhance patient care and mitigate the substantial morbidity

and mortality associated with ANVUGIB.

Key Words: Non-variceal upper gastrointestinal bleeding; Upper gastrointestinal bleeding; Gastrointestinal bleeding; Risk stratification; Risk assessment scores; Prognostication; Endoscopy; Esophagogastroduodenoscopy; Endoscopic hemostasis

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Core Tip: Acute non-variceal upper gastrointestinal bleeding (ANVUGIB) presents a significant medical challenge. Despite advancements in management, mortality remains high in the context of an increasingly elderly, comorbid population. While early risk stratification using established scoring systems ensures targeted management, newer scoring systems show promise in predicting mortality and should be integrated into medical practice after proper validation. Novel endoscopic techniques offer promising alternatives, especially in cases where conventional modalities are ineffective. By integrating validated scoring systems and adopting innovative therapeutic modalities, clinicians can enhance patient care and mitigate the substantial mortality associated with ANVUGIB.

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INTRODUCTION

Acute upper gastrointestinal bleeding (UGIB), defined as any bleeding originating above the ligament of Treitz in the duodenum, is a medical emergency commonly encountered in clinical practice[1,2]. According to their etiology, upper gastrointestinal hemorrhage is further subdivided into variceal and non-variceal UGIB (NVUGIB). Acute non-variceal UGIB (ANVUGIB) has an annual incidence of 67 per 100000 individuals and accounts for 80% of all cases of UGIB[3,4]. In the recent issue of the *World Journal of Clinical Cases*, we read with interest an article that elucidated the clinical characteristics of ANVUGIB by retrospectively analyzing patient data from a tertiary-care hospital in China[5]. The high mortality rates and the effectiveness of endoscopic hemostasis in the management of ANVUGIB particularly piqued our interest. Despite the advances in diagnostic and treatment modalities, NVUGIB remains a common medical problem owing to its sudden onset and rapid progression, prevalence of risk factors such as cardiovascular disease, increasing use of blood-thinning medications (such as aspirin, anticoagulants, and antiplatelet agents) and non-steroidal anti-inflammatory drugs (NSAIDs), and high morbidity and mortality[6,7]. The current guidelines recommend esophagogastroduodenoscopy (EGD) as the procedure of choice for both the diagnosis and management of NVUGIB and transcatheter angiographic embolization or surgery in cases of refractory bleeding[8-11]. Various risk assessment scores, such as the Glasgow-Blatchford Score (GBS) and the Rockall score, are routinely used for risk stratification in UGIB and may have a role in predicting the risk of mortality due to re-bleeding[12]. Thus, risk stratification and endoscopic interventions are key tools in deciding the line of management and determining morbidity and mortality. This editorial reviews the current demographics, etiologies, and risk factors associated with ANVUGIB and highlights the crucial role of early risk stratification in reducing mortality and endoscopic therapies in achieving hemostasis. It also discusses the emerging scoring systems and novel endoscopic technologies that show promise in guiding clinical decisions and reducing mortality.

DEMOGRAPHICS, ETIOLOGIES, AND RISK FACTORS OF NVUGIB

Males are affected more compared to females, with the majority of patients being older than 65 years[13,14]. Peptic ulcer disease (PUD) is the most common cause of ANVUGIB, followed by upper gastrointestinal malignancy, Mallory-Weiss syndrome, and gastric angiodysplasia[4,13].

Significant advancements in medicine have caused a reduction in ulcer-related bleeding over time due to the decreased incidence of PUD itself[13]. However, the mortality rates have not changed much, owing to the impact of co-morbidities in an aging population[2]. Cardiovascular disease (congestive heart failure, ischemic heart disease) is the most frequent comorbidity encountered in such patients, followed by diabetes mellitus, chronic liver disease, and chronic kidney disease[13,14].

Besides co-morbidities, there are other factors that increase the chances of mortality from NVUGIB. Particular attention must be paid to the patient's drug history. NSAIDs and aspirin (acetyl-salicylic acid) are recognized risk factors for increasing the chance of bleeding from peptic ulcers and severe erosive gastritis[15]. These drugs can cause NVUGIB by reducing prostaglandins in the gastric mucosa and increasing the susceptibility to mucosal damage[16,17]. The use of anticoagulants and antiplatelet drugs in an aging population with multiple co-morbidities may be associated with an increased risk of bleeding in NVUGIB[17,18]. *Helicobacter pylori* (*H. pylori*) infection represents the single most common

cause of PUD, which is in turn the leading cause of NVUGIB[19]. *H. pylori* status should be assessed in cases of NVUGIB due to PUD and reassessed after four weeks if the results are negative[10]. Yin and Yu[17] described a risk prediction model and concluded six independent risk factors for NVUGIB by analyzing two years' worth of clinical data retrospectively[17]. The risk factors for NVUGIB are summarized in Table 1.

RISK ASSESSMENT SCORES AS PREDICTORS OF INTERVENTIONS AND MORTALITY

Following successful initial resuscitation, patients should be stratified as low- and high-risk using risk assessment scoring systems to ensure appropriate patient disposition. These scoring systems act as clinical prediction guides and can be used to predict the line of treatment and mortality[20]. Getting timely endoscopic hemostatic treatment is crucial for improving the chances of survival, especially in high-risk groups. Proper evaluation of the patient's hemodynamic status and accurate risk assessment can lead to successful treatments. This is why a highly efficient scoring system is needed to help predict the prognosis and guide appropriate management[21]. There are a variety of scoring systems, each with different goals, like assessing the type of intervention, mortality, length of hospital stay, need for blood transfusions, *etc.* Some utilize only clinical data (pre-endoscopy scoring systems), while others require additional endoscopic findings (post-endoscopy scoring systems)[22]. A compilation of scoring systems is provided in Table 2.

Some well-established pre-endoscopy scoring systems are the Glasgow-Blatchford Score (GBS), pre-endoscopic Rockall Score, and AIMS65 (albumin, international normalized ratio, mental status, systolic blood pressure, age ≥ 65 years) score [23-25]. Initially developed to predict the need for intervention, the GBS has been found to possess the highest accuracy in predicting the need for hospital-based intervention and mortality[26]. As such, guidelines recommend the use of GBS for risk stratification in UGIB and state that patients with $GBS \leq 1$ have a low risk of mortality and can be managed as an outpatient[10,11,27].

The age, blood tests, co-morbidities (ABC) score and international bleeding score (INBS) are newly-developed pre-endoscopy scoring systems that can accurately predict the 30-day mortality in patients with NVUGIB[21,28]. The ABC score appeals as a clinical tool in terms of simplicity and ease of assessment at the bedside and has outperformed the traditional prognostic scores (which include scores like the GBS) in predicting mortality in patients with UGIB[29]. Studies have shown that the ABC score works better on younger patients compared to older patients[29]. The INBS is a novel prognostic score that is computed using medical history and biochemical results. It has been found to be superior to the traditional scoring systems in predicting mortality and can estimate the chances of re-bleeding, endoscopic hemostasis failure, and the duration of hospitalization[21]. These scoring systems need validation from large-scale studies before they can be incorporated into clinical practice.

Since post-endoscopy scores require endoscopy findings, it may delay risk assessment in setups where endoscopy is the limiting factor in UGIB management. Early risk stratification allows for early identification of high-risk patients, thereby ensuring targeted management of low- and high-risk patients[11,27]. Therefore, much of the focus should be on pre-endoscopy scoring systems, which can be calculated soon after patient presentation. Pre-endoscopy scores like the ABC score and INBS can be useful as quick and effective tools in predicting the outcomes of ANVUGIB, shortening hospital stays, and guiding clinical decisions to reduce mortality by increasing the chances of successful endoscopic hemostasis.

ENDOSCOPIC INTERVENTIONS FOR ACHIEVING HEMOSTASIS

After initial resuscitation and hemodynamic stabilization, patients with UGIB should undergo endoscopy within 24 h of admission. Endoscopy is the procedure of choice for the diagnosis and management of ANVUGIB[8-11]. Current guidelines recommend early endoscopy (within 24 h) in both high- and low-risk patients since early endoscopies result in early discharges, reduced length of hospital stay, and improved outcomes[2]. However, the optimal timing of endoscopy in high-risk patients remains controversial. While some studies found no significant difference in mortality rates between urgent and early endoscopies, other studies reported a reduction in hospital stay and mortality after urgent endoscopies in patients with ANVUGIB[30,31]. The advancement of endoscopic therapy has brought down the hospitalization rate and mortality of UGIB over the last decade[32]. Therapeutic upper gastrointestinal endoscopy *via* EGD has been effective in achieving hemostasis[9,15]. Traditionally, endoscopic therapies achieving hemostasis have been classified into three categories: Injection therapy (involving injection of epinephrine, sclerosant, and thrombin), thermal therapy (with contact or non-contact probes causing electrocoagulation), and mechanical therapy (with clips, loops, and ligation)[15]. These modalities form the mainstay of standard endoscopic management. However, the advancement of newer endoscopic devices has the potential to improve outcomes in cases where conventional therapies fail to achieve hemostasis[15]. Several new hemostatic techniques have emerged over the past decade[15], which have been summarized in Table 3. These novel techniques have diverse approaches, ranging from upgrading current techniques to creating new technologies. Some of them have been incorporated into the current guidelines and are recommended as rescue or salvage therapies, while others should be considered when conventional interventions have failed[9]. For instance, hemostatic powders (non-absorbable mineral powders) can achieve immediate hemostasis by forming an adhesive mechanical barrier on contact with water and may be considered in ANVUGIB due to malignancy[9,20,27]. Current guidelines recommend over-the-scope clips (large-caliber clips that allow full circumferential tissue closure of large lesions) in select NVUGIB cases (especially cases of recurrent and persistent bleeding) where standard endoscopic modalities fail to stop the bleeding[9,20,27]. Over-the-scope clipping systems are fast gaining prominence as possible first-line endoscopic treat-

Table 1 Risk factors for non-variceal upper gastrointestinal bleeding

Risk factors	Value of parameter
History of peptic ulcer	
<i>Helicobacter pylori</i> infection	
Use of anticoagulant and antiplatelet drugs	
Prolonged INR	INR \geq 1.21
Increase in leukocyte count	
Hypoalbuminemia	Serum albumin level < 35 g/L

INR: International normalized ratio.

Table 2 List of risk assessment scores for non-variceal upper gastrointestinal bleeding

Type of risk assessment score	Examples
Pre-endoscopy risk score	ABC score
	AIMS65 score
	CANUKA score
	Glasgow-Blatchford Score
	INBS
	MAP (ASH) score
	Pre-endoscopic Rockall score
Post-endoscopy risk score	Complete Rockall score
	CSMCPI score
	PNED score

ABC: Age, blood tests, co-morbidities; AIMS65: Albumin, International normalized ratio, Mental status, Systolic blood pressure, Age \geq 65 years; CANUKA: Canada–United Kingdom-Adelaide; INBS: International bleeding score; MAP (ASH): Mental status, American Society of Anesthesiology classification, Pulse, Albumin, Systolic blood pressure, Hemoglobin; CSMCPI: Cedars Sinai Medical Centre Predictive Index; PNED: Progretto nazionale emorragia digestiva.

ments since they are shown to outperform standard endoscopic modalities in reducing the bleeding risk and mortality in high-risk cases of NVUGIB[15,20]. These advancements have the potential to plug the loopholes of conventional therapies, but they are not without their fair share of limitations[15,20]. Further large-scale studies are needed to identify their indications and validate their effects on morbidity and mortality before they can be fully incorporated into clinical practice.

CONCLUSION

ANVUGIB is a common medical emergency that has a high mortality rate despite its declining incidence. As the majority of patients are elderly, the increasing burden of comorbidities and the prevalence of risk factors in the geriatric population increase the likelihood of poor outcomes in high-risk groups. The increasing use of drugs such as NSAIDs, antiplatelet agents, and anticoagulants (especially in the elderly population) underscores the significance of obtaining a thorough drug history. Early risk stratification with validated scoring systems is the key to determining the line of management. Newly developed scores (like the ABC score and INBS), which are superior to the traditional scores in predicting outcomes, should be incorporated into clinical guidelines after obtaining good-quality evidence. Upper gastrointestinal endoscopies have both diagnostic and therapeutic applications and should be performed within 24 h of patient admission. Novel advancements in endoscopic therapies like hemostatic powder and over-the-scope clips have the potential to become first-line treatments in cases where standard endoscopic therapies are ineffective. Clinicians should be aware of the recent advances in risk stratification and endoscopic interventions in order to make informed decisions about targeted management for low- and high-risk patients. By integrating validated scoring systems and leveraging cutting-edge therapeutic modalities, clinicians can enhance patient care and mitigate the substantial morbidity and mortality associated with this critical condition.

Table 3 Summary of emerging endoscopic modalities for the management of non-variceal upper gastrointestinal bleeding

Modality type	Endoscopic modalities	Mechanism of action
Injection	Endoscopic ultrasound-guided angiotherapy	Controls variceal bleeding by deploying coils and injecting cyanoacrylate glue directly into targeted vessels, and confirming the thrombosis in real time with Doppler
Thermal	Coagulation grasper (Coagrasper)	A combination mechanical and thermal hemostasis device that delivers targeted monopolar coagulation at the precise site of bleeding
	Radiofrequency ablation	High-frequency alternating electrical current delivered to local tissue <i>via</i> radiofrequency electrode, causing thermal coagulative necrosis of the targeted tissue
	Cryotherapy	Induces cell necrosis through cycles of controlled local freezing and thawing of the tissue
	Endoscopic laser coagulation	Instantaneous hemostatic effect due to alterations in structural proteins in the vessel wall causing vessel shrinkage
Topical	Hemospray (TC-325 hemostatic powder)	Non-absorbable mineral powder that forms an adhesive mechanical barrier upon contact with water
	EndoClot (polysaccharide hemostatic powder)	Absorbable modified plant-based polymer that forms a protective gel matrix and concentrates coagulation factors upon contact with water
	Oxidized regenerated cellulose	Absorbable plant-based polymer that provides a matrix for clot formation and enhances platelet activation and adhesion
	Ankaferd Blood Stopper	Standardized mixture of plant extracts that induces formation of an encapsulated protein network which provides focal points for vital erythrocyte aggregation
Mechanical	Over-the-scope clip system	Large caliber clips made of metal alloy nitinol with shape-memory effect that stops bleeding by exerting constant circumferential compression force on the bleeding site
	Endoscopic suturing device	Excludes peptic ulcer from the intra-gastric acidic environment to prevent rebleeding
	Endoscopic band ligation	Complete obliteration of varices by causing mechanical strangulation with rubber bands

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REFERENCES

- Hearnshaw SA, Logan RF, Lowe D, Travis SP, Murphy MF, Palmer KR. Acute upper gastrointestinal bleeding in the UK: patient characteristics, diagnoses and outcomes in the 2007 UK audit. *Gut* 2011; **60**: 1327-1335 [PMID: 21490373 DOI: 10.1136/gut.2010.228437]
- Biecker E. Diagnosis and therapy of non-variceal upper gastrointestinal bleeding. *World J Gastrointest Pharmacol Ther* 2015; **6**: 172-182 [PMID: 26558151 DOI: 10.4292/wjgpt.v6.i4.172]
- Almadi MA, Almutairdi A, Alruzug IM, Aldarsouny TA, Semaan T, Aldaher MK, AlMustafa A, Azzam N, Batwa F, Albawardy B, Aljebreen A. Upper gastrointestinal bleeding: Causes and patient outcomes. *Saudi J Gastroenterol* 2021; **27**: 20-27 [PMID: 33047678 DOI: 10.4103/sjg.SJG_297_20]
- Lanas A, Dumonceau JM, Hunt RH, Fujishiro M, Scheiman JM, Gralnek IM, Campbell HE, Rostom A, Villanueva C, Sung JY. Non-variceal upper gastrointestinal bleeding. *Nat Rev Dis Primers* 2018; **4**: 18020 [PMID: 29671413 DOI: 10.1038/nrdp.2018.20]
- Wang XJ, Shi YP, Wang L, Li YN, Xu LJ, Zhang Y, Han S. Clinical characteristics of acute non-varicose upper gastrointestinal bleeding and the effect of endoscopic hemostasis. *World J Clin Cases* 2024; **12**: 1597-1605 [PMID: 38576734 DOI: 10.12998/wjcc.v12.i9.1597]
- Lau JY, Barkun A, Fan DM, Kuipers EJ, Yang YS, Chan FK. Challenges in the management of acute peptic ulcer bleeding. *Lancet* 2013; **381**:

- 2033-2043 [PMID: 23746903 DOI: 10.1016/S0140-6736(13)60596-6]
- 7 **Laine L**, Jensen DM. Management of patients with ulcer bleeding. *Am J Gastroenterol* 2012; **107**: 345-60; quiz 361 [PMID: 22310222 DOI: 10.1038/ajg.2011.480]
- 8 **Laine L**, Barkun AN, Saltzman JR, Martel M, Leontiadis GI. ACG Clinical Guideline: Upper Gastrointestinal and Ulcer Bleeding. *Am J Gastroenterol* 2021; **116**: 899-917 [PMID: 33929377 DOI: 10.14309/ajg.0000000000001245]
- 9 **Mullady DK**, Wang AY, Waschke KA. AGA Clinical Practice Update on Endoscopic Therapies for Non-Variceal Upper Gastrointestinal Bleeding: Expert Review. *Gastroenterology* 2020; **159**: 1120-1128 [PMID: 32574620 DOI: 10.1053/j.gastro.2020.05.095]
- 10 **Gralnek IM**, Stanley AJ, Morris AJ, Camus M, Lau J, Lanas A, Laursen SB, Radaelli F, Papanikolaou IS, Cúrdia Gonçalves T, Dinis-Ribeiro M, Awadie H, Braun G, de Groot N, Udd M, Sanchez-Yague A, Neeman Z, van Hooft JE. Endoscopic diagnosis and management of nonvariceal upper gastrointestinal hemorrhage (NVUGIH): European Society of Gastrointestinal Endoscopy (ESGE) Guideline - Update 2021. *Endoscopy* 2021; **53**: 300-332 [PMID: 33567467 DOI: 10.1055/a-1369-5274]
- 11 **Barkun AN**, Almadi M, Kuipers EJ, Laine L, Sung J, Tse F, Leontiadis GI, Abraham NS, Calvet X, Chan FKL, Douketis J, Enns R, Gralnek IM, Jairath V, Jensen D, Lau J, Lip GYH, Loffroy R, Maluf-Filho F, Meltzer AC, Reddy N, Saltzman JR, Marshall JK, Bardou M. Management of Nonvariceal Upper Gastrointestinal Bleeding: Guideline Recommendations From the International Consensus Group. *Ann Intern Med* 2019; **171**: 805-822 [PMID: 31634917 DOI: 10.7326/M19-1795]
- 12 **Custovic N**, Husic-Selimovic A, Srsen N, Prohic D. Comparison of Glasgow-Blatchford Score and Rockall Score in Patients with Upper Gastrointestinal Bleeding. *Med Arch* 2020; **74**: 270-274 [PMID: 33041443 DOI: 10.5455/medarch.2020.74.270-274]
- 13 **Falcão D**, Alves da Silva J, Pereira Guedes T, Garrido M, Novo I, Pedroto I. The Current Portrayal of Non-Variceal Upper Gastrointestinal Bleeding in a Portuguese Tertiary Center. *GE Port J Gastroenterol* 2021; **28**: 392-397 [PMID: 34901445 DOI: 10.1159/000516139]
- 14 **Asotibe JC**, Shaka H, Akuna E, Shekar N, Shah H, Ramirez M, Sherazi SAA, Khoshbin K, Mutneja H, Attar B. Outcomes of Non-Variceal Upper Gastrointestinal Bleed Stratified by Hospital Teaching Status: Insights From the National Inpatient Sample. *Gastroenterology Res* 2021; **14**: 268-274 [PMID: 34804270 DOI: 10.14740/gr1437]
- 15 **Naseer M**, Lambert K, Hamed A, Ali E. Endoscopic advances in the management of non-variceal upper gastrointestinal bleeding: A review. *World J Gastrointest Endosc* 2020; **12**: 1-16 [PMID: 31942229 DOI: 10.4253/wjge.v12.i1.1]
- 16 **Drini M**. Peptic ulcer disease and non-steroidal anti-inflammatory drugs. *Aust Prescr* 2017; **40**: 91-93 [PMID: 28798512 DOI: 10.18773/austprescr.2017.037]
- 17 **Yin L**, Yu W. Retrospective analysis of risk factors for non-variceal upper gastrointestinal bleeding and construction of a nomogram prediction model. *Am J Transl Res* 2023; **15**: 3385-3393 [PMID: 37303672]
- 18 **Tham TC**, James C, Kelly M. Predicting outcome of acute non-variceal upper gastrointestinal haemorrhage without endoscopy using the clinical Rockall Score. *Postgrad Med J* 2006; **82**: 757-759 [PMID: 17099097 DOI: 10.1136/pmj.2006.048462]
- 19 **Saleem N**, Howden CW. Update on the Management of Helicobacter pylori Infection. *Curr Treat Options Gastroenterol* 2020; **18**: 476-487 [PMID: 32837180 DOI: 10.1007/s11938-020-00300-3]
- 20 **Lau LHS**, Sung JY. Treatment of upper gastrointestinal bleeding in 2020: New techniques and outcomes. *Dig Endosc* 2021; **33**: 83-94 [PMID: 32216134 DOI: 10.1111/den.13674]
- 21 **Kim MS**, Moon HS, Kwon IS, Park JH, Kim JS, Kang SH, Sung JK, Lee ES, Kim SH, Lee BS, Jeong HY. Validation of a new risk score system for non-variceal upper gastrointestinal bleeding. *BMC Gastroenterol* 2020; **20**: 193 [PMID: 32552662 DOI: 10.1186/s12876-020-01346-4]
- 22 **Orpen-Palmer J**, Stanley AJ. A Review of Risk Scores within Upper Gastrointestinal Bleeding. *J Clin Med* 2023; **12** [PMID: 37297873 DOI: 10.3390/jcm12113678]
- 23 **Blatchford O**, Murray WR, Blatchford M. A risk score to predict need for treatment for upper-gastrointestinal haemorrhage. *Lancet* 2000; **356**: 1318-1321 [PMID: 11073021 DOI: 10.1016/S0140-6736(00)02816-6]
- 24 **Rockall TA**, Logan RF, Devlin HB, Northfield TC. Risk assessment after acute upper gastrointestinal haemorrhage. *Gut* 1996; **38**: 316-321 [PMID: 8675081 DOI: 10.1136/gut.38.3.316]
- 25 **Saltzman JR**, Tabak YP, Hyett BH, Sun X, Travis AC, Johannes RS. A simple risk score accurately predicts in-hospital mortality, length of stay, and cost in acute upper GI bleeding. *Gastrointest Endosc* 2011; **74**: 1215-1224 [PMID: 21907980 DOI: 10.1016/j.gie.2011.06.024]
- 26 **Stanley AJ**, Laine L, Dalton HR, Ngu JH, Schultz M, Abazi R, Zakko L, Thornton S, Wilkinson K, Khor CJ, Murray IA, Laursen SB; International Gastrointestinal Bleeding Consortium. Comparison of risk scoring systems for patients presenting with upper gastrointestinal bleeding: international multicentre prospective study. *BMJ* 2017; **356**: i6432 [PMID: 28053181 DOI: 10.1136/bmj.i6432]
- 27 **Sung JJ**, Chiu PW, Chan FKL, Lau JY, Goh KL, Ho LH, Jung HY, Sollano JD, Gotoda T, Reddy N, Singh R, Sugano K, Wu KC, Wu CY, Bjorkman DJ, Jensen DM, Kuipers EJ, Lanas A. Asia-Pacific working group consensus on non-variceal upper gastrointestinal bleeding: an update 2018. *Gut* 2018; **67**: 1757-1768 [PMID: 29691276 DOI: 10.1136/gutjnl-2018-316276]
- 28 **Laursen SB**, Oakland K, Laine L, Bieber V, Marmo R, Redondo-Cerezo E, Dalton HR, Ngu J, Schultz M, Soncini M, Gralnek I, Jairath V, Murray IA, Stanley AJ. ABC score: a new risk score that accurately predicts mortality in acute upper and lower gastrointestinal bleeding: an international multicentre study. *Gut* 2021; **70**: 707-716 [PMID: 32723845 DOI: 10.1136/gutjnl-2019-320002]
- 29 **Li Y**, Lu Q, Song M, Wu K, Ou X. Comparisons of six endoscopy independent scoring systems for the prediction of clinical outcomes for elderly and younger patients with upper gastrointestinal bleeding. *BMC Gastroenterol* 2022; **22**: 187 [PMID: 35418035 DOI: 10.1186/s12876-022-02266-1]
- 30 **Güven İE**, Başpınar B, Durak MB, Yüksel İ. Comparison of urgent and early endoscopy for acute non-variceal upper gastrointestinal bleeding in high-risk patients. *Gastroenterol Hepatol* 2023; **46**: 178-184 [PMID: 35605821 DOI: 10.1016/j.gastrohep.2022.05.002]
- 31 **Kim J**, Gong EJ, Seo M, Park JK, Lee SJ, Han KH, Kim YD, Jeong WJ, Cheon GJ, Seo HI. Timing of endoscopy in patients with upper gastrointestinal bleeding. *Sci Rep* 2022; **12**: 6833 [PMID: 35477727 DOI: 10.1038/s41598-022-10897-3]
- 32 **Wuerth BA**, Rockey DC. Changing Epidemiology of Upper Gastrointestinal Hemorrhage in the Last Decade: A Nationwide Analysis. *Dig Dis Sci* 2018; **63**: 1286-1293 [PMID: 29282637 DOI: 10.1007/s10620-017-4882-6]



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